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Monographs on education

DIVISION OF EXHIBITS
DEPARTMENT OF EDUCATION
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MONOGRAPHS ON EDUCATION

IN THE

UNITED STATES

EDITED BY

NICHOLAS MURRAY BUTLER
President of Columbia University in the City of New York

10

PROFESSIONAL EDUCATION

BY

JAMES RUSSELL PARSONS JR
Director of the College and High School Departments, University of the State of New York, Albany, New York

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DEPARTMENT OF EDUCATION

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MONOGRAPHS

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EDUCATION IN THE UNITED STATES

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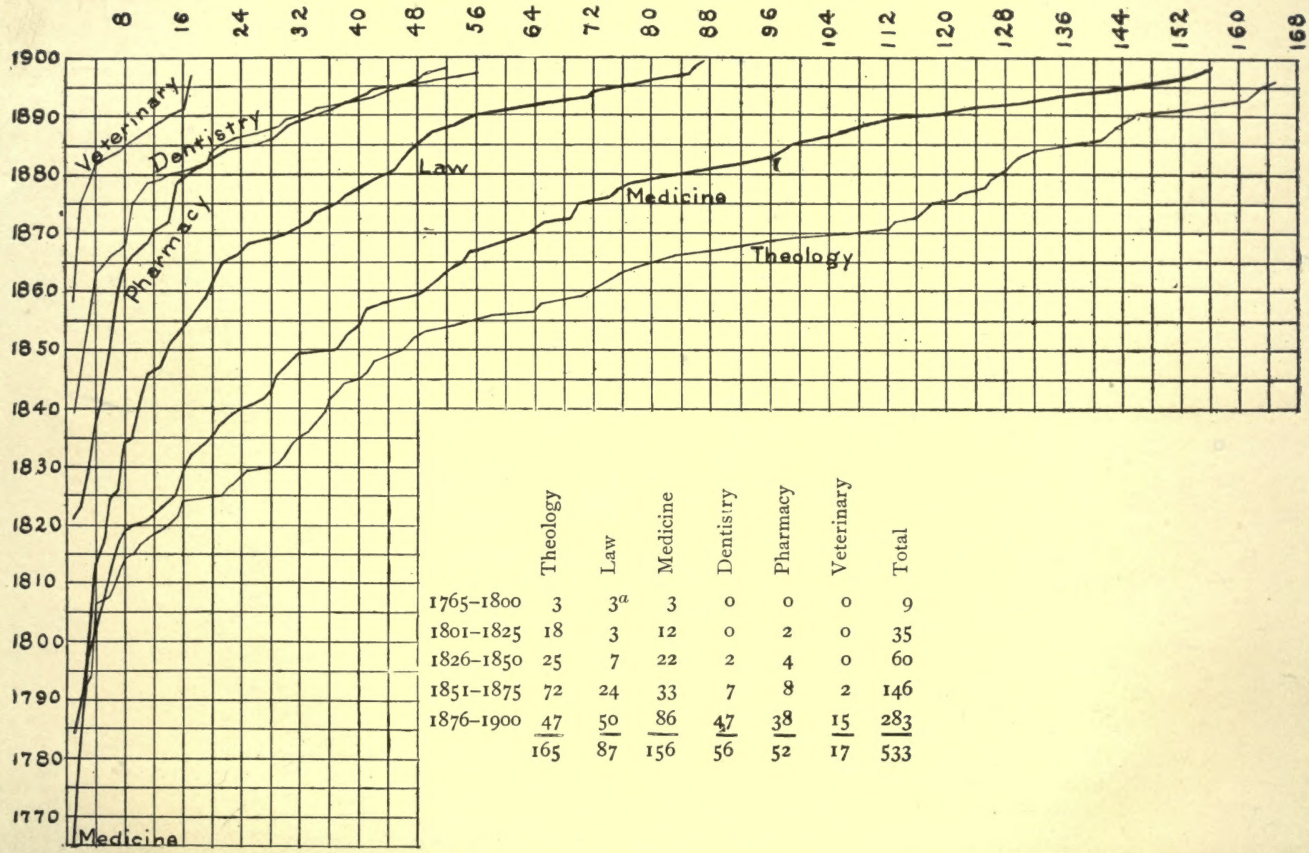
Rise of professional schools 1765–1900



	Theology	Law	Medicine	Dentistry	Pharmacy	Veterinary	Total
1765–1800	3	3[a]	3	0	0	0	9
1801–1825	18	3	12	0	2	0	35
1826–1850	25	7	22	2	4	0	60
1851–1875	72	24	33	7	8	2	146
1876–1900	47	50	86	47	38	15	283
	165	87	156	56	52	17	533

[a] Extinct Litchfield school and first attempts at college of Philadelphia and Columbia.

PROFESSIONAL EDUCATION

I GENERAL

Preacademic, grammar or common school work refers to the eight years of elementary instruction; secondary or academic work, to the four years of secondary instruction between elementary school and college; college work, to the four years of higher instruction, following the four years of secondary. Professional institutions are uniformly called schools.

Authorities — It is impossible within the limits of this monograph to give more than a brief outline of professional education in the United States. For detailed information touching laws, regulations, location of schools, and courses of study the reader is referred to *Professional education in the United States*, published by the University of the State of New York.

Of the many authorities consulted the following have proved most helpful: U. S. education reports; Eliot's *Educational reform;* U. S. census reports; Briggs' *Theological education and its needs;*[1] Dyer's *Theological education in America;*[2] Jessup's *Legal education in New York;*[3] Wellman's *Admission to the bar;*[4] Hammond's *American law schools, past and future;*[5] *Reports of the American bar association;* Toner's *Annals of medical progress in the United States;*[6] Davis' *Medical education and medical institutions in the United States;*[7] *Journal American medical association;* Shepard's *Inaugural address at the World's Columbian dental congress; Proceedings of the American pharmaceutical association.* These and other authorities have been used freely, but limited space makes it impracticable to give in many cases more than this general acknowledgment.

[1] *Forum*, January 1892. [2] *Penn monthly*, August 1880. [3] See the *History of the bench and bar of New York.* [4] *American law review*, May 1881. [5] *Southern law review*, August 1881. [6] *U. S. education report*, 1874. [7] *U. S. education report*, 1877.

Assistance rendered by specialists is acknowledged in the chapter relating to each profession.

Growth — At the time of the declaration of independence there were only two professional schools in this country, the Medical college of Philadelphia (1765), now the medical department of the University of Pennsylvania, and the medical department of King's college (1768).[1]

The following statistics, summarized from *Professional education in the United States*, show unprecedented growth :[2]

	Schools 1899	Instructors 1899	Students 1898	Graduates 1898	Students 1899
Theology	165	1 070	8 317	1 693	8 093
Law	86	970	11 783	3 110	11 883
Medicine	[3]156	[3]5 735	[3]24 043	[3]5 725	[3]24 119
Dentistry	56	1 513	7 221	1 921	7 633
Pharmacy	[4]52	[4]492	[4]3 525	[4]1 122	[4]3 563
Veterinary medicine	17	249	368	123	378
[5]Total	532	10 029	55 257	13 694	55 669

In 1898, 286 of the 532 schools reported total property amounting to nearly $50,000,000 (New York 33 per cent),

[1] King's college is now Columbia university.

[2] The 1898 U. S. education report gives the following:

	Schools	Instructors	Students	Graduates
Theology	155	958	8 371	1 673
Law	83	845	11 615	3 065
Medicine	151	4 247	23 433	5 597
Dentistry	50	961	6 774	1 848
Pharmacy	45	401	3 712	1 129
Veterinary medicine	14	173	326	109
Total	498	7 585	54 231	13 421

[3] Excluding graduate schools, but including 3 medical preparatory schools.

[4] Including Department of pharmacy, University of Washington, which has suspended temporarily.

[5] In these totals training schools for nurses are not included. The Philadelphia lying-in, charity and nurse school was opened in 1828, but it is said that systematic training in schools for nurses was not given till 1873. The 1898 U. S. education report gives 377 of these schools with 8805 students. The course of study is usually two years in length though nearly 1-4 of the schools now require three years. Most of these schools are connected with hospitals where medical, surgical and obstetric cases are treated. The course of study embraces anatomy, physiology and hygiene, and obstetrics.

Distribution of professional students in 1899

Red, political divisions with professional schools having more than 1000 students
Blue, political divisions with professional schools having less than 1000 students
White, political divisions without professional schools

The map does not show Alaska, Hawaii and Puerto Rico which have no professional schools, or Cuba and the Philippines where professional schools are connected with the universities at Havana and Manila respectively.

262 reported receipts exceeding $5,000,000 (New York 31 per cent), 270 expenditures exceeding $4,500,000 (New York 28 per cent). Degrees are granted by 73 theological schools, 82 law schools, 152 medical schools, 56 dental schools, 45 schools of pharmacy and 16 veterinary medical schools.

Distribution of professional schools and students in 1899[1]—38 political divisions of the United States report professional schools and students as follows:

Division	Theology		Law		Medicine		Dentistry		Pharmacy		Veterinary		Total	
Sc. =school; St. =student.	Sc.	St.	Sc.	St.	Sc.	St.	Sc.	St.	Sc.	St.	Sc.	St.	Sc.	St.
Illinois	18	1 210	9	1 308	16	3 065	5	1 282	2	284	2	82	52	7 231
New York	17	1 039	7	2 202	11	2 415	3	503	4	536	3	82	45	6 777
Pennsylvania	17	813	3	526	6	2 475	5	1 503	3	619	1	52	35	5 988
Missouri	6	448	3	366	16	2 345	4	485	2	177	1	25	32	3 846
Ohio	13	432	6	705	13	1 392	5	589	5	418	1	14	43	3 550
Massachusetts	8	514	2	974	4	1 066	2	302	1	178	1	27	18	3 061
Maryland	6	561	2	277	8	1 331	3	497	1	106	0	0	20	2 772
Tennessee	8	226	6	211	9	1 876	4	301	3	75	0	0	30	2 689
Michigan	3	102	2	918	6	877	2	346	2	129	2	26	17	2 398
Kentucky	3	401	2	96	7	1 011	1	179	1	60	0	0	14	1 747
District Columbia	5	105	5	892	5	460	3	135	2	46	2	27	22	1 665
Iowa	5	204	2	365	5	631	2	135	3	210	1	27	18	1 572
California	5	78	3	323	6	576	4	395	2	83	1	7	21	1 462
Indiana	4	161	4	456	4	305	2	258	2	170	1	7	17	1 357
Minnesota	8	277	1	446	3	428	1	110	1	62	0	0	14	1 323
Virginia	4	194	3	236	3	618	2	36	2	22	0	0	14	1 106
Georgia	2	98	4	75	3	449	2	258	1	31	0	0	12	911
Wisconsin	4	160	2	259	2	198	1	135	1	61	0	0	10	813
Texas	1	16	2	176	2	290	0	0	1	40	0	0	6	522
Louisiana	1	23	1	72	2	388	0	0	1	18	0	0	5	501
New Jersey	5	459	0	0	0	0	0	0	1	26	0	0	6	485
Connecticut	3	152	1	194	1	109	0	0	0	0	0	0	5	455
Colorado	2	33	2	93	4	253	2	50	0	0	0	0	10	429
Nebraska	3	59	2	117	3	179	1	58	0	0	0	0	9	413
Alabama	3	61	1	27	3	239	1	42	2	41	0	0	10	410
Kansas	1	9	1	166	3	172	0	0	1	45	0	0	6	392
North Carolina	3	81	2	86	3	167	0	0	2	25	0	0	10	359
Maine	2	78	1	31	2	171	0	0	1	13	0	0	6	293
Vermont	0	0	0	0	1	215	0	0	0	0	0	0	1	215
Oregon	2	53	2	65	2	182	0	0	0	0	0	0	6	200
South Carolina	3	46	1	25	1	97	0	0	1	27	0	0	6	195
Arkansas	0	0	1	26	1	108	0	0	0	0	0	0	2	134
New Hampshire	0	0	0	0	1	131	0	0	0	0	0	0	1	131
West Virginia	0	0	1	125	0	0	0	0	0	0	0	0	1	125
Washington	0	0	1	0	0	0	1	34	2	33	1	2	5	69
Mississippi	0	0	1	45	0	0	0	0	0	0	0	0	1	45
Oklahoma	0	0	0	0	0	0	0	0	1	18	0	0	1	18
South Dakota	0	0	0	0	0	0	0	0	1	10	0	0	1	10
	165	8 093	86	11 883	156	24 119	56	7 633	52	3 563	17	378	532	55 669

The following report no professional schools: Alaska, Arizona, Delaware, Florida, Hawaii, Idaho, Indian territory, Montana, Nevada, New Mexico, North Dakota, Puerto Rico, Rhode Island, Utah, Wyoming.

[1] Not including students at the University of Havana: law 124, medicine 98, pharmacy 98 (1899), or at the University of Santo Tomas, Manila: theology 6, law 558, medicine 404, pharmacy 51 (1897). Grand total, including also 1916 graduate medical students, 58,924.

Illinois leads for the first time in professional students, a fact due to a lack of proper control of the power to grant degrees and licenses. Including students in graduate medical schools, New York and Illinois report about the same number of professional students in 1899.

Varying standards — There is no national authority in the United States that can prescribe standards for degrees or for license to practise the professions. Each state makes its own professional laws. As a result there are almost as many standards as there are political divisions. The desirability of uniform standards throughout the country for admission to professional practice is recognized generally, but varying conditions as to density of population, educational advantages and general development make it impracticable to hope for the attainment of this end for some time to come.[1]

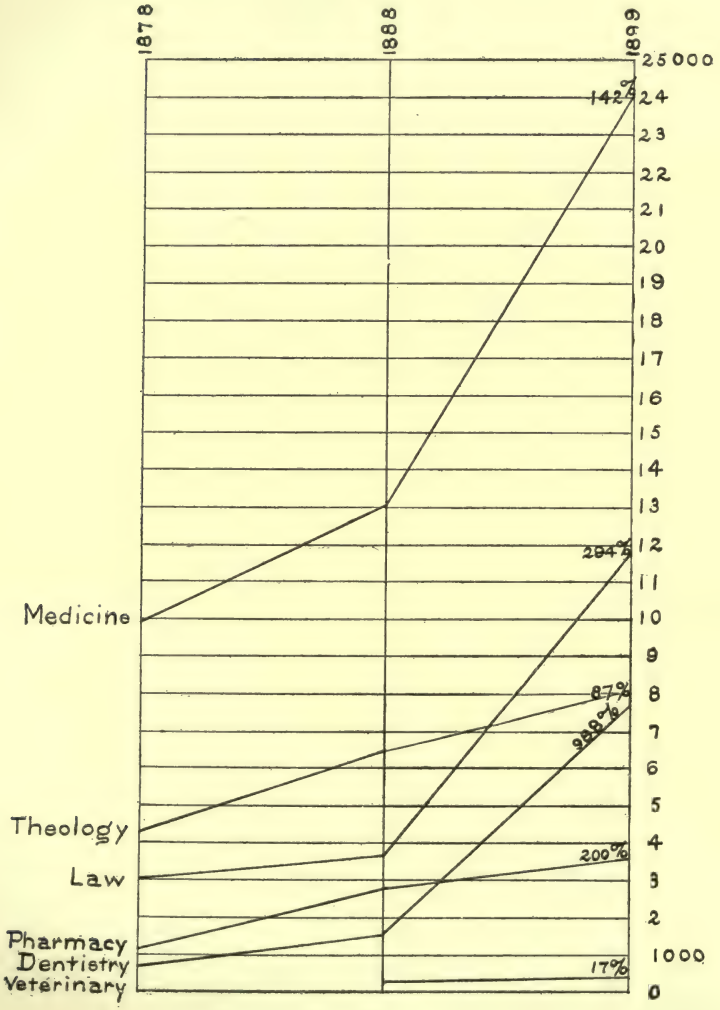
30 years ago the public had little protection from incompetency in professional practice. The bar is said to have been at its lowest ebb. Medical laws were crude and largely inoperative. In several states only were there any acts designed to control the practice of pharmacy and dentistry. There was no law whatever restricting the practice of veterinary medicine.

There has been extraordinary progress, specially in the last decade, in restrictive professional legislation, and in the admission and graduation requirements of professional schools throughout the United States. In view of these facts the growth in professional students is remarkable. From 1888 to 1899 the increase was as follows: theology 24 per cent, law 224 per cent, medicine 84 per cent, dentistry 380 per cent, pharmacy 31 per cent, veterinary medicine 17 per cent.

In 1890, when the last U. S. census was taken, the ratio to population for each given profession was: clergymen 1 to 710, lawyers 1 to 699, physicians 1 to 598, dentists 1 to 3579. The corresponding ratios for 1870 were: clergymen 1 to 879, lawyers 1 to 946, physicians 1 to 617, dentists 1 to

[1] See section on Influence of medical societies.

Growth in professional students



4919. In each profession there has been a growth which is greater proportionately than the growth in population.[1]

Preliminary general education for licenses — In New York state a preliminary general education equivalent to graduation from a four years' high school course after a completed eight years' elementary course is prescribed by statute as the minimum standard for license to practise medicine. This standard approximates that required in continental Europe. New Hampshire has similar requirements, but they are not as rigidly enforced. The statutes of Delaware, Maryland, New Jersey and Pennsylvania prescribe a "common school education." Louisiana demands "a fair primary education." The rules in Vermont prescribe a high school course; in Illinois and Iowa less than one year of high school work; in Virginia, "evidence of a preliminary education." In remaining political divisions laws and rules are either silent in this respect or so indefinite (Arkansas and other political divisions) as to be of little value.

In New York and Illinois (after Jan. 1, 1900) a preliminary general education equivalent to a three years' high school course is required for admission to the bar. Connecticut demands a high school education or an indefinite preliminary examination. The minimum requirement in Michigan (in case of examination) is less than two years of high

[1] These returns were first given in 1860 when the ratio to population (31,443, 321) was: clergymen (37,529) 1 to 837, lawyers (33,193) 1 to 947, physicians (54,543) 1 to 576, dentists (5606) 1 to 5608. Following are the figures for 1870, 1880 and 1890:

	Population	Clergymen	Lawyers	Physicians	Dentists
1870	38 558 371	43 874	40 736	62 448	7 839
1880	50 155 783	64 698	64 137	85 671	12 314
1890	62 622 250	88 203	89 630	104 805	17 498

Students at these periods were reported as follows in 1897 by the American bar association:

	Theology	Law	Medicine	Dentistry	Pharmacy
1870	3 254	1 653	6 198	257	512
1880	5 242	3 134	11 929	730	1 347
1890	7 013	4 518	16 660	2 696	2 871

school work, in Colorado it is one year of high school work, in Minnesota (in case of examination) it is less than one year, in Ohio it is a common school education. If anything is demanded in other political divisions the requirement is not sufficiently established (excepting a few local cases) to find a place either in statutes or court rules.

The New York law exacts a full high school course as one of the requirements for license to practise dentistry.[1] New Jersey demands by statute "a preliminary education equal to that furnished by the common schools," Pennsylvania "a competent common school education," Virginia a "fair academic education." In other political divisions there is no such requirement.[2] Louisiana, Michigan, South Dakota, Wisconsin, and, in case of examination, California and Texas are the only political divisions which mention in their rules preliminary general education as a requirement for license to practise pharmacy. An elementary education only is prescribed. The completion of a full high school course or its equivalent is one of the statutory requirements for license to practise veterinary medicine in New York.[3] Pennsylvania demands "a competent common school education." There is no such requirement in any other state.

Preliminary general education for degrees — In New York, high standards in preliminary general education are demanded both for degrees and for licenses,[4] and in each case the question of attainments is determined by a central authority, the University of the State of New York. As a rule in other states the professional schools conduct their own entrance examinations, and the tests are often mere matters of form, even though the standards may appear satisfactory on paper.

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[1] For matriculates before Jan. 1, 1901, 3 years in a high school are accepted. [2] See section on Dental societies. [3] For matriculates before Jan. 1, 1901, 2 years in a high school are accepted. [4] Excepting licenses to preach and licenses to practise pharmacy.

Entrance requirements

In 4 theological schools there are no entrance requirements; in 24 schools they are indefinite. 19 demand a grammar school education. 1, 6 and 19 require respectively one, two and three years of high school work. 18, 3 and 71 demand respectively one, three and four years of college work.

In 16 law schools there are apparently no entrance requirements whatever; in 8 schools they are so indefinite as to be practically worthless. 26 schools demand a grammar school education. 8, 11, 12 and 3 require respectively one, two, three and four years of high school work. Harvard demands an education equivalent to that required for admission to the senior class. The Columbia law school will be maintained as a graduate department after 1903.

In 2 medical schools the requirements are indefinite; 29 demand a grammar school education; 97, 12, 3 and 12 require respectively one, two, three and four years of high school work. Johns Hopkins requires a college course, Harvard also after Sep. 1901.

In 3 dental schools the requirements are indefinite; 18 demand a grammar school education; 18, 11 and 6 require respectively one, two and three years of high school work.

In 6 schools of pharmacy there are no entrance requirements; in 4 schools they are indefinite. 24 demand a grammar school education; 11, 6 and 1 require respectively one, two and three years of high school work.

In 1 veterinary medical school the requirements are indefinite; 9 demand a grammar school education; 1, 5 and 1 require respectively one, two and three years of high school work.

Professional students with college degrees — The 1894 U. S. education report states that probably nearly one half of the theological students held either B.A. or B.S. degrees (46 1-2 per cent), as compared with only about 20 per cent of law students. The corresponding returns from medical schools were so imperfect that they were not tabulated. Tables in the 1897 U. S. education report indicate that of

schools reporting graduate students 49 per cent of the students in theology, 24 per cent of those in law and 14 per cent of those in medicine held either B.A. or B.S. degrees. The corresponding returns for 1898 were 53 per cent in theology, 29 per cent in law, and 21 per cent in medicine.

Following is a classification of schools 1) that report graduate students, 2) that report no graduate students, 3) that do not report this item:

		Schools		Students		Hold B. A. or B. S. degrees		Per cent	
		1897	1898	1897	1898	1897	1898	1897	1898
Theology	1	93	85	5 217	5 086	2 566	2 696	49	53
	2	26	28	635	850	0	0	0	0
	3	37	42	2 321	2 435	[1]	[1]	[1]	[1]
Law	1	56	41	7 997	6 289	1 932	1 825	24	29
	2	2	2	29	20	0	0	0	0
	3	25	40	2 423	5 306	[1]	[1]	[1]	[1]
Medicine	1	76	64	10 709	9 969	1 498	2 094	14	21
	2	5	3	160	146	0	0	0	0
	3	69	91	13 508	14 339	[1]	[1]	[1]	[1]

Courses in theology, law and medicine are naturally graduate courses and will eventually be maintained as such by leading universities. It is believed, however, that it would not be advisable or even desirable for the state to make graduation from college the minimum requirement in general education for degrees even in these faculties. High school graduation is sufficient for the minimum state requirement. Anything farther than this should be left to individual initiative.[2]

[1] Not reported.

[2] There are few graduate students in dentistry, pharmacy or veterinary medicine. In library science, however, which under New York's leadership will develop rapidly throughout the United States, a thorough college training will soon be the usual requirement of all strong schools for admission to the professional course. In 1900 for example all but two of the entering class of 31 at the New York state library school are graduates of colleges or universities registered as maintaining proper standards. In public accounting which was raised by New York to the dignity of a profession in 1896 the New York requirement of a full four years' high school course will doubtless be accepted generally as the standard in preliminary general education. Additional requirements in New York for full C. P. A. (certified public accountant) certificates are three years' satisfactory experience in the practice of accounting (one of which has been in the office of an

Length of professional courses—The following table shows as a rule great progress, specially since 1885, in the adoption of higher standards for graduation.

	Four years	Three years	Two years	One year	Not stated
Theological schools 1875	26	77	9	0	11
" 1885	26	98	6	0	22
" 1897	22	116	7	1	11
" 1898	[1]20	117	8	0	10
" 1899	[2]41	116	7	1	0
Law schools 1875	0	1	30	10	2
" 1885	0	5	38	6	0
" 1897	0	21	47	7	2
" 1898	0	38	36	4	5
" 1899	0	44	37	4	1
Medical schools 1875	0	[3]3	[3]72	5	0
" 1885	0	5	103	0	0
" 1897	99	49	0	2	0
" 1898	103	42	0	0	[4]6
" 1899	141	10	2	2	1
Dental schools 1875	0	0	12	0	0
" 1885	0	5	13	0	0
" 1897	1	47	0	0	0
" 1898	1	49	0	0	0
" 1899	1	55	0	0	0
Schools of pharmacy 1875	0	0	10	3	1
" 1885	0	0	21	0	0
" 1897	0	5	34	2	2
" 1898	1	5	35	4	0
" 1899	[5]1	6	38	7	0
Veterinary medical schools 1897	0	10	2	0	0
" 1898	0	12	2	0	0
" 1899	0	14	3	0	0

expert public accountant) and examinations in the theory of accounts, practical accounting, auditing and commercial law. Pennsylvania has a C. P. A. law, and attempts have been made to secure similar legislation in Illinois, Maryland, New Jersey and Minnesota.

[1] Including 4 schools that report courses of five years.

[2] Including 17 schools that report courses of more than four years.

[3] Distinction between medical schools with two and three-year courses not certain.

[4] Including 3 medical preparatory schools.

[5] Department of pharmacy, University of Washington, which has suspended temporarily.

Professional schools now remain in session for a much greater part of the year than formerly:

Length of courses in months, 1899

	Unknown or less than 6	6–7	7–8	8–9	9–10	More than 10	Total
Theology	0	3	37	57	54	14	165
Law	1	2	6	52	21	4	86
Medicine	10	74	45	21	6	0	156
Dentistry	12	24	11	4	5	0	56
Pharmacy	5	16	11	10	5	5	52
Veterinary medicine	5	5	2	4	1	0	17
Total	33	124	112	148	92	23	532

Evening sessions occur less frequently:

	Day sessions	Evening sessions	Both	Unknown	Total
Law	49	24	7	6	86
Medicine	135	5	9	7	156
Dentistry	47	4	0	5	56
Pharmacy	36	9	4	3	52
Veterinary medicine	7	0	3	7	17
Total	274	42	23	28	367

University supervision — As long as the public had practically no protection from incompetency in professional practice independent proprietary schools flourished. With proper restrictive legislation such institutions will either die or fall under university supervision.

Many professional schools not under university supervision show a self-sacrificing zeal for high standards and an absence of the commercial spirit that might well be emulated by all institutions connected with colleges or universities. Nevertheless independent institutions are realizing more than ever before the disadvantages of working without university privileges and tend more and more toward university connections or university relations.

In 1899, 257 schools were separate institutions and 275 were departments of colleges or universities as follows:

	Separate institutions	Departments	Total
Theology	119	46	165
Law	16	70	86
Medicine	82	74	156
Dentistry	20	36	56
Pharmacy	14	38	52
Veterinary medicine	6	11	17
Total	257	275	532

Scholarships — Theological seminaries, when not endowed, are supported by funds from the denominations they represent. Tuition is generally free, and in many cases board and lodging are furnished. Additional help is given usually when needed, and generous scholarships are the rule. In other professional schools scholarships are comparatively rare. The 1895 U. S. education report gives 40 law school scholarships and 295[1] medical school scholarships. The largest, offered by College of physicians and surgeons, New York, pays $700 a year and is bestowed to promote the discovery of new facts in medical science.

An examination of 82 law school catalogues for 1899 shows that 48 scholarships are offered definitely. Tuition is free at the law department of Howard university, the law departments of the universities of Kansas, Texas and West Virginia. The Harvard law school and the Boston university law school offer a "limited number of free scholarships." Law students may compete for the 150 state scholarships and the 18 university scholarships offered annually at Cornell and for the 50 city scholarships offered by the University of Pennsylvania. The law department of Centre college offers free tuition to sons of ministers and to all young men of limited means and good character. 3 schools give fellowships annually as follows: New York law school,

[1] "Many of these are not scholarships in a strict sense."— *U. S. education report*, 1895

1 at $500 a year, good for from one to three years; Law department University of Pennsylvania, 1 at $300, good for one year; Pittsburg law school, 1 at $250, good for one year. 32 schools offer cash prizes amounting to $3010 and law and reference books as other prizes.

151 medical school catalogues for 1899 report definitely only 152 scholarships and 11 fellowships. These are offered by 31 schools. 5 other schools refer indefinitely to scholarships. At Cornell and the University of Pennsylvania medical students may compete for state and university, or city scholarships on an equal footing with those who would enter other departments. Tuition is free at the Army medical school, the medical department of the University of Texas and the medical preparatory school of the University of Kansas. 19 schools give cash prizes amounting to $5685; 57 offer hospital appointments as prizes; 47 give gold medals, surgical instruments and other prizes.

56 dental school catalogues for 1899 show that 7 schools offer 58 scholarships.[1] The dental department of the University of Maryland deducts one half from tuition fees of one student from each state on recommendation of his state dental society. The Baltimore college of dental surgery had similar beneficiary scholarships till 1898 when they were abolished. 18 schools offer prizes but their value is not great.

52 catalogues of schools of pharmacy for 1899 show that 5 schools offer 12 scholarships and 2 fellowships. Tuition is free at the schools of pharmacy connected with the Alabama polytechnic institute, Washington agricultural college, Purdue university, and the universities of Kansas, Ohio, Oklahoma, Texas, Washington and Wisconsin. 15 schools offer prizes, usually medals or pharmaceutic instruments. 5 of these 15 schools give cash prizes amounting to $620. The committee on revision of the *U. S. pharmacopœia* has instituted fellowships in the University of Michigan and the University of Wisconsin for the discovery of new facts in pharmacy.

[1] See section on Subjects discussed in dentistry.

16 veterinary school catalogues for 1899 show that 19 scholarships are offered by 5 schools, that 1 school gives a fellowship and that 6 schools offer prizes. Tuition is free at the veterinary departments of Cornell and Ohio universities, and of Washington agricultural college. Cornell opens to competition by veterinary students, 18 scholarships and to veterinary graduates a fellowship of an annual value of $500. Veterinary matriculates are eligible for 50 city scholarships offered by the University of Pennsylvania. The veterinary department of Ohio state university offers a scholarship in each county in which the agricultural scholarship is not taken.

Fees—Tuition is free in 132 theological schools. Only 8 have matriculation fees, 33 a course fee and 34 other fees. The average matriculation fee is $5.38, the average course fee $91.61, the average of other fees $22.06.

Tuition is free in 4 law schools. 23 have matriculation fees (average $14), 83 have course fees (average $69.80), 59 have other fees (average $10.86).

Tuition is free in 3 medical schools. 119 have matriculation fees (average $10.68), 153 have course fees (average $82.39), 129 have other fees (average $49.47).

Tuition is not free in any dental school. 40 have matriculation fees (average $8.62), 56 have course fees (average $94.32), 5 have other fees (average $33.48).

Tuition is free in 9 schools of pharmacy. 28 have matriculation fees (average $8.07), 43 have course fees (average $58.90), 50 have other fees (average $37.90).

Tuition is free in 3 veterinary medical schools. 7 have matriculation fees (average $7.85), 14 have course fees (average $81.28), 12 have other fees (average $43.50).

Libraries—In 1898 the U. S. commissioner of education reported 1,360,720 volumes in libraries of 118 theological schools, 243,054 in libraries of 47 law schools, 151,433 in libraries of 72 medical schools, 6901 in libraries of 16 dental schools, 22,156 in libraries of 17 schools of pharmacy. 3 theological schools, 9 law schools, 21 medical schools, 9

dental schools and 2 schools of pharmacy reported that they had no libraries. 34 theological schools, 27 law schools, 58 medical schools, 25 dental schools and 26 schools of pharmacy made no report on this item. Libraries in veterinary medical schools were not reported.

Following were the largest libraries:

Theology

	Volumes
Union theological seminary, presbyterian	71 576
Hartford theological seminary, congregational	68 029
Princeton theological seminary, presbyterian	61 648
Andover theological seminary, congregational	51 000
Seminary of the Reformed Dutch church in America	43 700

Law

Harvard university, law department	44 000
Cornell university, law department	26 000
Columbia university, law department	25 000
University of Pennsylvania, law department	18 904
Yale university, law department	[1] 12 000

Medicine

Hahnemann medical college, Philadelphia	15 000
Hahnemann medical college, Chicago	12 000
University of Michigan, homeopathic medical dep't	10 000
University of Pennsylvania, medical department	10 000
Johns Hopkins medical school	7 712

Dentistry

Marion Sims college of medicine, dental department	[2] 2 000
Ohio medical university, dental department	[3] 2 000
University of Michigan, dental department	[1] 600

Pharmacy

Philadelphia college of pharmacy	10 000
Massachusetts college of pharmacy	[1] 5 132
University of Illinois, department of pharmacy	1 800

[1] Approximate.

[2] Only one library for medical and dental dep'ts.

[3] Only one library for medical, dental and pharmacy dep'ts.

Endowments—The 1898 U. S. education report gives the following:

84 theological schools report endowments of $17,977,325. 54 do not report this item. 17 state that they are not endowed.

19 medical schools report endowments of $1,906,072. (In 1897, 14 medical schools reported endowments of $648,262.) 84 do not report this item. 48 state that they are not endowed.

8 law schools report endowments of $752,500. The law department of the University of Cincinnati reports also an endowment that yields an income of $7500. (In 1897, 4 law schools reported endowments of $431,000.) 48 do not report this item. 27 report that they are not endowed.

1 dental school, the Harvard dental school, reports an endowment of $50,000. 20 report that they are not endowed. 29 do not report this item.

2 schools of pharmacy, the Massachusetts college of pharmacy ($13,675) and the Albany college of pharmacy ($2381) report endowments of $16,056. 17 report that they are not endowed. 26 do not report this item.

Following were the largest endowments:

Theology	
Princeton theological seminary, presbyterian	$1 369 000
Union theological seminary, presbyterian	[1] 1 350 000
General theological seminary, protestant episcopal	1 260 987
Chicago theological seminary, congregational	968 820
Andover theological seminary, congregational	850 000
Law	
Harvard university, law department	400 000
University of California, law department	135 000
Catholic university of America, law department	[2] 100 000
Medicine	
Columbia university, medical department	480 000
Johns Hopkins medical school	427 000
Woman's medical college of Pennsylvania	296 772
Yale university, medical department	106 000

[1] 1897. [2] Approximate.

Value of grounds and buildings — The 1898 U. S. education report gives the following values of grounds and buildings:

98 theological schools, $13,863,628. 54 do not report this item. 3 report that they do not own grounds or buildings.

19 law schools, $1,431,000. 58 do not report this item. 6 report that they do not own grounds or buildings.

96 medical schools, [1]$11,264,263. 53 do not report this item. 2 report that they do not own grounds or buildings.

15 dental schools, [2]$1,019,836. 30 do not report this item. 5 report that they do not own grounds or buildings.

15 schools of pharmacy, $656,417. 25 do not report this item. 5 report that they do not own grounds or buildings.

The following report the greatest values in grounds and buildings:

Theology

General theological seminary, protestant episcopal ..	$1 353 000
St Joseph's seminary, Roman catholic.....	1 100 000
Western theological seminary, presbyterian.....	780 055
Princeton theological seminary, presbyterian.....	500 000
Union theological seminary, presbyterian.....	500 000

Law

University of Cincinnati, law department.....	350 000
Boston university law school.....	225 000
Harvard university, law department.....	150 000
New York university, law department.....	120 000
Vanderbilt university, law department	100 000

Medicine

Columbia university, medical department.....	2 000 000
Jefferson medical college.....	600 000
Hahnemann medical college, Philadelphia.....	523 763
Cooper medical college.....	460 000
New York homeopathic medical college....	450 000

[1] In 1897, 93 schools reported $7,271,009.

[2] In 1897, 13 schools reported $627,500.

Dentistry

Baltimore medical college, dental department	[1]$200 000
Philadelphia dental college	170 000
New York college of dentistry	120 000
Detroit college of medicine, dental department	[2]105 336
Pennsylvania college of dental surgery	70 000

Pharmacy

New York college of pharmacy	204 067
Philadelphia college of pharmacy	150 000
Northwestern university, school of pharmacy	[3]75 000
Massachusetts college of pharmacy	68 850
Maryland college of pharmacy	37 000

When grounds and buildings are used for several departments, as for example the Columbia law school which is in the library building, values are not always reported.

Total and average property, receipts and expenditures in 1898 — It is interesting to compare with the preceding figures those given in *Professional education in the United States:*

Total

	Schools	Property	Schools	Receipts	Schools	Expenditures
Theology	87	$27 785 997	76	$1 561 516	83	$1 420 921
Law	27	3 053 265	31	565 295	33	540 887
Medicine	126	15 346 030	111	2 185 216	111	2 022 503
Dentistry	19	1 150 915	23	459 996	22	421 689
Pharmacy	19	981 932	13	167 098	13	173 994
Veterinary med.	8	426 697	8	86 598	8	89 604
	286	$48 744 836	262	$5 025 719	270	$4 669 598

Average

	Property	Receipts	Expenditures
Theology	$319 379 27	$20 546 26	$17 119 53
Law	113 083 88	18 235 32	16 390 52
Medicine	137 666 90	19 686 63	18 220 74
Dentistry	60 574 47	19 999 82	19 167 68
Pharmacy	51 680 63	12 853 69	13 384 15
Veterinary medicine	53 337 12	10 824 75	11 200 50

[1] Cost of medical and dental buildings; dental buildings and grounds cost less than $75,000. [2] Includes medical and pharmacy dep'ts. [3] Reported in *Professional education in the United States*, $24,000.

Gifts and bequests — The following made up from Appleton's *Annual cyclopedia* shows the amount of gifts and bequests for educational purposes (including hospitals), of $5000 each and upward in value for each year from 1894 to 1898. The extraordinary total of $110,952,199 is divided as follows: theological schools $1,918,500, law schools $127,500, medical schools $2,631,000, hospitals $16,593,701, libraries $14,143,888, general education $75,537,610.[1]

Year	Theology	Law	Medicine		Libraries	Gen. educ.	Total
			Schools	Hospitals			
1894	$554 000	$12 500	$126 000	$1 911 000	$3 927 721	$11 681 262	$18 212 483
1895	570 000	.....	755 000	2 722 367	3 602 667	10 817 255	18 467 289
1896	305 000	.....	.....	5 096 667	2 197 000	13 894 058	21 492 725
1897	244 500	115 000	.....	3 394 167	2 341 000	21 224 166	27 318 833
1898	245 000	.....	1 750 000	3 469 500	2 075 500	17 920 869	25 460 869
	$1 918 500	$127 500	$2 631 000	$16 593 701	$14 143 888	$75 537 610	$110 952 199

Women as professional students — The 1898 U. S. education report shows that women now appear as students in professional schools of each class except those in veterinary medicine. In nursing they are of course in a large majority, 8004 as compared with 801 men. In the other professions they are reported as follows: theology 198, law 147, medicine 1397, dentistry 162, pharmacy 174. The proportion of women in regular medical schools is much smaller than in homeopathic, eclectic and physiomedical schools, showing that women prefer the medical sects.

[1] Including the most notable gifts and bequests for all public purposes the grand total for these five years is $174,800,000. The ordinary denominational contributions for educational and benevolent purposes, all state and municipal appropriations to public and sectarian institutions and the grants of congress for the relief of suffering in Cuba are excluded.

The following table made up from *Professional education in the United States* gives the division of professional schools by sex in 1899:

SCHOOLS	Men	Women	Both	Total
Theology	101	0	64	165
Law	22	0	64	86
Medicine	69	7	80	156
Dentistry	12	0	44	56
Pharmacy	4	0	48	52
Veterinary medicine	14	0	3	17

Power to confer degrees — Low standards in many professional schools are due to a failure to subject the degree-conferring power to strict state supervision. In New York and Pennsylvania the laws now prevent an abuse of the power to confer degrees.[1] In Massachusetts and Vermont bodies formed under the general corporation acts are prohibited from conferring degrees. In Ohio and Nebraska the statutes require only the nominal endowment of $5000 for a degree-conferring institution. In other states and territories as a rule any body of men may form an educational corporation with power to confer degrees "without any guaranty whatever that the privilege will not be abused."[2]

This matter has been under discussion recently in various educational bodies and there is a strong sentiment in favor of a strict supervision by the state of the degree-conferring power.[3]

[1] A similar bill, strongly advocated by educators, was defeated at the last session of the Illinois legislature through the efforts of politicians and others in favor of low standards.

[2] Edward Avery Harriman, *Educational franchise* (R. Am. bar. ass., 1898).

[3] In 1897 the section of legal education of the American bar association resolved that the degree-conferring power should be "subject to strict state supervision to be exercised in a manner somewhat similar to that which is exercised by the regents of the University of the State of New York." In an address before the National educational association in 1897, Pres. Henry Wade Rogers said: "There should be established in each state a council of education, which should be intrusted with powers similar to those vested in the regents of the University of the State of New York, and it should be composed of the most eminent men in the state without any reference to political considerations. No degree-conferring institution should be incorporated without the approval of the council of education."

2 THEOLOGY

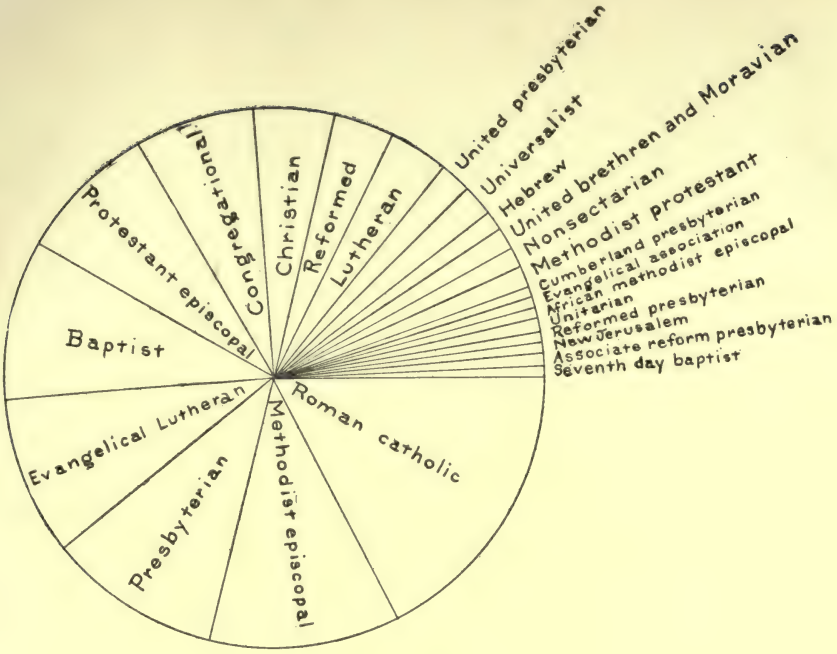
Schools, faculty and students — In the United States there is no connection between church and state. Each religious denomination establishes such theological schools as may be required. In 1899 the 165 schools had 1070 instructors and 8093 students. 2 schools were nonsectarian, and the rest were distributed among 23 religious denominations in the order of students for 1899 as follows:[1]

DENOMINATIONS	SCHOOLS	FACULTY	STUDENTS		
	1899	1899	1898	1898 Grad.	1899
1 Roman catholic	29	222	1 635	330	1 700
2 Baptist	16	102	1 286	171	1 142
3 Presbyterian	17	125	1 066	283	1 034
4 Methodist episcopal	19	107	1 005	166	981
5 Evang. Lutheran	17	73	876	234	851
6 Congregational	12	108	556	133	492
7 Protestant episcopal	14	92	460	87	430
8 Christian	8	41	429	40	424
9 Reformed church	6	51	180	59	188
10 Lutheran	5	19	142	39	143
11 United presbyterian	3	10	129	45	121
12 Hebrew	2	15	92	8	104
13 Moravian (United brethren)	2	11	81	23	92
14 Nonsectarian	2	19	73	7	72
15 Cumberland presbyterian	1	7	65	11	65
16 Universalist	3	24	61	18	54
17 Methodist protestant	2	6	35	0	51
18 Evangelical association	1	2	34	9	44
19 African methodist episcopal	1	5	37	5	37
20 Unitarian	1	16	18	4	26
21 Reformed presbyterian	1	2	28	9	20
22 New Jerusalem	1	6	12	2	13
23 Associate reform presbyterian	1	4	14	10	7
24 Seventh day baptist	1	3	3	0	2
Total	165	1 070	8 317	1 693	8 093

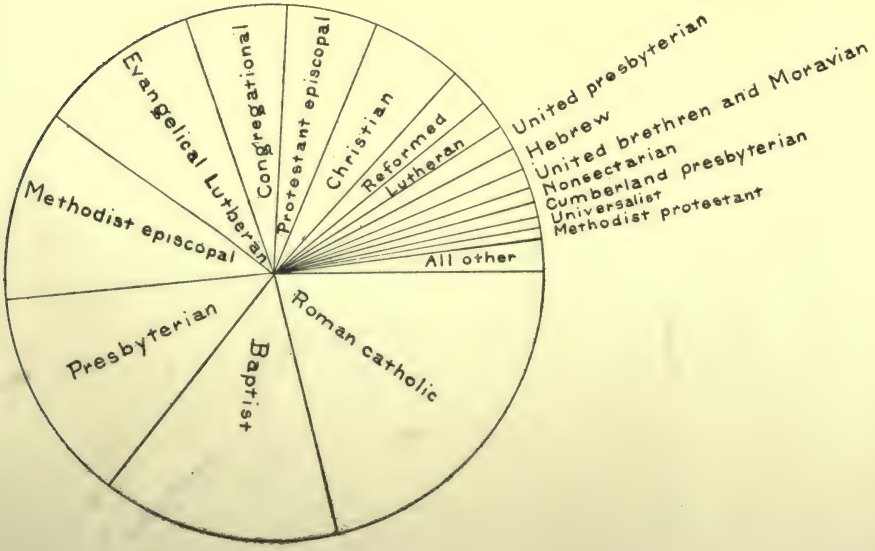
[1] The U. S. census report for 1890 gives 119 denominations associated in ecclesiastical groups (18,841,790 members), 24 which are not thus associated and some independent miscellaneous congregations (1,771,016 members). The 119 denominations are arranged according to number of communicants as follows:

1 R. catholic (7) [*See* chart]	6 257 871	8 United brethren (2)	225 281
2 Methodist (17)	4 589 284	9 Latter-day saint (2)	166 125
3 Baptist (13)	3 712 468	10 Hebrew (2)	130 496
4 Presbyterian (12)	1 278 332	11 Friend (4)	107 208
5 Lutheran (16)	1 231 072	12 Christian (2)	103 722
6 Episcopalian (2)	540 509	13 Dunkard (4)	73 795
7 Reformed (3)	309 458	14 Adventist (6)	60 491

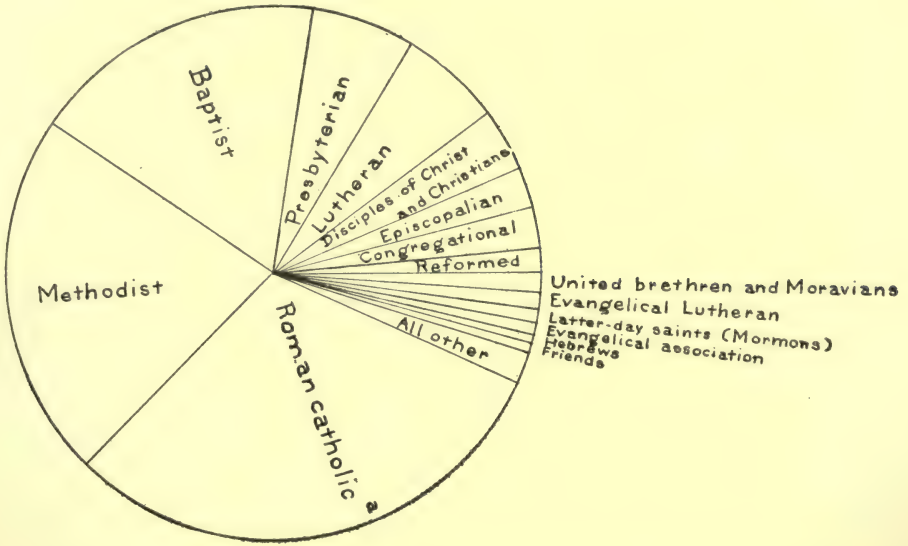
Theological schools in 1899



Theological students in 1899



Membership of leading religions, U. S. census 1890



a Includes also Russian orthodox (13,504) Greek catholic (10,850), Reformed catholic (1000), Old catholic (665), Armenian (335), Greek orthodox (100)

In 1878 there were 125 schools with 4320 students. The growth in students in 21 years has been 87 per cent.

The seminaries have increased their requirements steadily so that all the great divisions of theology are now represented in their faculties. In 1899, 1 school had a course of 7 years, 10 a course of 6 years, 6 a course of 5 years, 24 a course of 4 years, 116 a course of 3 years, 7 a course of 2 years and 1 a course of 1 year. 73 grant degrees.

Early theological training — The rise of independent seminaries marked the second step in the development of theological education in this country. A desire to educate candidates for the ministry had influenced the founding of colleges at a much earlier period. In fact our first institutions for higher education owed their origin to this desire. The chief object in the founding of Harvard college (1636) for example was to provide an educated ministry. Cotton Mather in his *Magnalia Christi Americana* gives a list of New England churches in 1696 which shows that of 129 pulpits supplied by 116 pastors, 107 of the clergymen were graduates of Harvard college. The colleges founded at New Haven (1700) and at Princeton (1748) followed Harvard in making education free to candidates for the ministry who could not meet their own expenses.

In England candidates for the ministry usually pursued a university course which included several studies that bore on their future calling. In addition to the college degree they were examined on certain theological books which they

15 Mennonite (12)	41 541	17 Communistic societies (8)	4 049
16 Plymouth Brethren (4)	6 661	18 (River) Brethren (3)	3 427

The independent sects may be classified as follows:

Disciple of Christ	641 051	Universalist	49 194
Congregationalist	512 771	Spiritualist	45 030
Evang. Lutheran	223 588	Moravian	11 781
Evang. association	133 313	New Jerusalem	7 095
Unitarian	67 749	Other	79 444

[Estimates revised to April 1, 1898 give total communicants 26,054,385; Roman catholics (7) 8,410,592, methodists (17) 5,735,898, baptists (13) 4,232,962.]

H. D. Sedgwick jr in the October 1899 *Atlantic monthly* writes that the proportion of Roman catholics to the whole population in 1783 was 1 in 80, in 1829, 1 in 16, in 1844, 1 in 15, in 1890, 1 in 10.

had read either in private or with the assistance of a preceptor. This same scheme was followed in this country in the 17th and 18th centuries. The college faculty included as a rule a professor of Hebrew and a professor of theology and their work was supplemented by the study of theological books either in private or under the oversight of an experienced clergyman.

Rise of independent seminaries — At the close of the 18th century the colleges had departed so far from the special purpose of their creation that it was thought necessary to establish theological seminaries. For more than half a century private theological schools had been in existence. Dr Joseph Bellamy of Connecticut conducted the first of these institutions that attained distinction and some of his graduates opened other similar schools. The theological seminary proper, however, had its origin in this country in the closing years of the 18th century. In England when the universities were closed to those outside of the established church, new institutions sprang up but these included academic as well as theological courses. In this country the seminaries "became a supplement to the college, not a substitute as in England." Undoubtedly the desire to have schools in which their special religious doctrines might be taught influenced the denominations in America that had no secular colleges to found their own theological seminaries, but the necessity for the more definite and systematic training of the theological schools seems to have been felt by all.

The history of the existing institutions that are specially devoted to preparation for the ministry is limited with three exceptions to the present century. The Seminary of the reformed Dutch church in America was founded in 1784. In that year Drs Livingston and Meyer were set apart to be professors of theology and the method of training men for the ministry by any individual pastor whom the student might select was formally discontinued. The succession of classes since 1784 has been continuous with the exception of two or three years. These years were not consecutive so

that the work of the professors has been continuous. This work was done first in New York, then at Flatbush, L. I. and since 1810 at New Brunswick, N. J.

St Mary's seminary was founded at Baltimore in 1791 and is under the direction of members of the Society of St Sulpice. Xenia theological seminary is the result of the consolidation in 1874 of the Seminary of the northwest with the Associate seminary at Xenia. The Theological seminary of the associate presbyterian church of North America was located originally at Service, Beaver co. Pa. in 1794, when Dr John Anderson was elected professor of theology by the Associate synod. In 1821 the seminary was transferred to Cannonsburg, Pa. and in 1855 to Xenia, Ohio.

In 1782 the Associate reformed synod was formed by the union of the Associate presbyteries and the Reformed presbyteries. Those who refused to accept this union established the Theological seminary of the associate presbyterian church of North America at Service, Beaver co. Pa. The Associate reformed synod opened a theological seminary in New York in 1805.

In 1808 New England congregationalists united in opening the theological school at Andover. In 1812 the General assembly of the presbyterian church founded the Princeton theological seminary. In 1815 Hartwick seminary, the oldest Lutheran theological school in this country, was opened in Otsego co. N. Y. In 1817 the General convention of the protestant episcopal church established the General theological seminary in New York where instruction was first given in 1819. The seminary was removed to New Haven in 1820 but was reopened in New York in 1822. In 1820 the Baptist education society opened Hamilton theological seminary, the first theological school established by baptists in the United States, since 1893 a department of Colgate university. The Reformed church in the United States founded the theological seminary at Carlisle, Pa. in 1825. In 1839 the methodists founded their first theological seminary "in commemoration of the first centennial of

ecumenical methodism." The institution was opened in 1840 at Newbury, Vt., was removed to Concord, N. H. in 1847, to Boston in 1867 and became in 1871 the theological department of Boston university.

Of the 165 existing theological schools 3 were established before 1800, 18 between 1801 and 1825, 25 between 1826 and 1850, 72 between 1851 and 1875, 47 between 1876 and 1900. When the necessity of systematic training for the ministry was recognized theological schools were established. The multiplication of these schools, however, is due to some extent to differences of opinion touching matters pertaining to the Christian faith. When men can not think alike even in details that seem trivial they split frequently into sects which sometimes found theological seminaries to teach their own peculiar views. In an interesting paper on the causes and remedy of the disunion of Christendom the rector of St Andrew's, Rochester, expresses the opinion that the purpose of the church to discipline life, to make men pure and just and kind is often lost sight of in an effort to secure intellectual agreement concerning the most abstruse and difficult subjects that the human mind can entertain. Bishop Whipple of Minnesota emphasizes the other side of this picture as follows: "Never in the world's history has there been such enthusiasm in all humanitarian work as now. Not even in the primitive church have greater victories been won in leading heathen folk to Christian civilization."

Religious bodies vary greatly with regard to the training deemed essential for the ministry. The training of the Roman catholic priest for example begins normally at about the age of 12 when the candidate is secluded in many ways from contact with secular life, living and working constantly under ecclesiastical supervision. On the other hand the protestant candidate for the ministry is usually free to choose his teachers, studies and associates, and he does not begin his special training till he has finished his general education and entered the theological school. Again episcopalians,

presbyterians and congregationalists for example have exacted as a rule a comparatively good general and professional education. The methodists on the other hand have not laid so much stress on intellectual training. They did not open a theological school till 1840 and even in 1899 the methodist seminaries did not report so many students as the presbyterian though in the United States there were probably about four times as many methodists as presbyterians. Almost from the date of their organization, however, the methodists have maintained a scheme of systematic theological examinations, and recently progress has been made toward a more thorough training. They now supervise with special care the scholastic work of their higher institutions of learning.

It is commonly asserted that many theological seminaries notwithstanding their comparatively high admission requirements do not maintain the educational standards required by other professional schools, and that students in these seminaries are seldom dropped through failure to reach a satisfactory intellectual standing. As the Rev. W. F. Whitaker of Albany says, however, we should not overlook the fundamental difference between theology and other professions. Physical disease demands everywhere the same skill but intellectual training necessary for the cure and care of souls varies with varying needs.

University relations— Some theologians magnify the advantages that arise from the pursuit of a common purpose in independent seminaries. In their judgment these seminaries accomplish much more thorough work in theology than that done for example at Oxford and Cambridge. Other writers emphasize the fact that "the theologian needs the contact of other minds just as do other specialists," and that it is a mistake to divorce the study of theology from that of the other sciences. In the United States the seminaries long restricted the study of theology to candidates for the ministry; laymen neglected this field almost entirely and theologians on the other hand were narrowed by the seclusion of the seminary.

The work of independent theological schools is of course much more thorough than that which the secular colleges attempted with the aid of individual clergymen, but the isolation of these schools is a disadvantage when we compare them with some of the great universities abroad in which theology is the leading faculty.

The recognition of this fact marked the third step in the development of theological education in this country. In 1819 Harvard[1] and in 1822 Yale[2] organized separate theological faculties. In 1899, 46 colleges and universities had theological faculties, and 13 independent schools had entered into such relations with neighboring universities that their students were able to enjoy many university privileges. These friendly relations now exist, even between different denominations. The Episcopal theological school at Cambridge, Mass. has for example many of the advantages offered by Harvard university, the Episcopal divinity school at Philadelphia shares advantages offered by the University of Pennsylvania, the Union theological seminary in New York those afforded to the students of Columbia and New York universities.

Present tendencies— Dr C. A. Briggs wrote as follows on theological education in 1892:

"The course in theology is still very defective in the great majority of the theological schools . . . but no one can deny real and great progress . . . The backbone of theological training is still Hebrew exegesis, Greek exegesis, church history, systematic theology, pastoral theology and homiletics . . . The scientific method is beginning to revolutionize theological education; but this movement is only in its beginnings."

In recent years there has been a tendency to extend the elective system in seminary courses. Some theologians contend that these courses should be entirely elective; others,

[1] The first professorship established in the university was the Hollis professorship of divinity, established in 1721. The differentiation of the divinity school from the college was very gradual.

[2] The chair of divinity was established in 1755.

that they should require a symmetric training in all fundamental branches, and that the choice of studies should be limited to those that are demanded by special tastes or by special lines of work.

In an essay on the education of protestant ministers, published in the *Princeton review* in 1883, and republished in 1898 in *Educational reform*, President Eliot gives the following suggestions touching this matter:

"The subjects which in our day should be set before a candidate for the ministry are divisible into two classes: those which every candidate should master, and those from which every candidate should make a limited selection. . . . The preliminary subjects which every student of theology should in my judgment be required to master are as follows:

1 Languages: Greek (including New testament Greek), Latin, Hebrew and German

2 English literature, with practice in writing, and study of style

3 The elements of psychology

4 The elements of political economy

5 Constitutional history, or the history of some interesting period of moderate length

6 Science: botany, zoology, or geology, studied in the laboratory and the field.

The requisitions in the languages other than English are the only ones in this list which are now habitually enforced in theological seminaries."

. . .

"Having finished the preliminary required studies, the candidate for the ministry is ready to enter upon the advanced studies which may properly be called professional. Since preaching is to be his most important function, he will naturally give a good share of his time to homiletics and the practice of writing and speaking. The other subjects which are now included under the comprehensive term 'theology' or 'divinity' may be grouped as follows:

1 Semitic studies: linguistic, archeologic and historical
2 New testament criticism and exegesis
3 Ecclesiastical history
4 Comparative religion or historic religions compared
5 Psychology, ethics, and the philosophy of religion
6 Systematic theology, and the history of Christian doctrine
7 Charitable and reformatory methods, and the contest of Christian society with licentiousness, intemperance, pauperism and crime."

. . .

"Any three of these seven groups thoroughly studied, in addition to homiletics and the preliminary required studies, would in my judgment give a far better training for the protestant ministers of our day than is now offered in any theological seminary in my knowledge."

In this essay Pres. Eliot deals only "with the surroundings and mental furnishing of the minister, not with his inspiration." He does not maintain that there is no need of uneducated ministers or that men of genius are dependent on systematic training or that "sensibility, earnestness and piety" are not the most essential qualities. He does say, however, that men of genius are rare and that it is not the business of universities and theological seminaries to provide "uninstructed exhorters."

3 LAW

Early law schools — The first American law school was founded at Litchfield, Ct. in 1784 and discontinued in 1833. Though not connected with any university it seems to have made an excellent record. Of 1023 graduates, 50 became members of congress, 15 U. S. senators, 40 judges of the higher state courts, 10 governors of states, 5 cabinet officers, 2 justices of the federal supreme court, 1 vice-president of the United States and several foreign ministers.

A course of lectures in law was delivered in the College of Philadelphia in 1791 by James Wilson who had been appointed professor of law in that institution, but his work was discontinued before the close of the second course. In 1797 James Kent made a similar attempt at Columbia, but he gave only one course of lectures.

The Harvard law school, established in 1817, was the earliest school in the country connected with a university and authorized to confer degrees in law. The course was lengthened to 3 years in 1877. There were no examinations for the degree till 1871, and none for admission till 1877. At the beginning of the year 1897 the rule came into force by which only graduates of approved colleges and persons qualified to enter the senior class of Harvard college are admitted as regular students.

The Yale law school was established in 1824, that of the University of Virginia in 1825 and the Cincinnati law school in 1833.

Development of law schools since 1858 — Law schools had exercised little influence on the legal profession in this country up to the time of the opening of the Columbia law school in 1858. The extinct Litchfield school and the unsuccessful attempts at the college of Philadelphia and Columbia constitute the record up to 1800. 3 of the existing schools were established between 1801 and 1825, 7 between 1826 and 1850, 24 between 1851 and 1875, 50 between 1876 and 1900. The growth of the Columbia law school was quite

steady from the first. In 1859 there were 35 students, in 1876, 573, in 1889, 491. In 1888 the trustees decided to add a third year to the course to take effect in the fall of 1890. In 1899 they adopted a resolution converting the school into a graduate department by limiting admission to college graduates, the change to take effect in the fall of 1903.

Since 1858 the growth in law schools has been most remarkable. In 1878 there were 50 schools with 3012 students; in 1899 there were 86 schools with 11,883 students. The increase in students in 21 years has been 294 per cent. These figures show that the old method of study in the office of an attorney is rapidly giving place to the systematic training of the law school. In fact it is impracticable under existing conditions to obtain a satisfactory legal education in an attorney's office.[1]

The greatest drawback to efficient work in our law schools as shown elsewhere, is failure to demand a satisfactory preliminary education for admission. There has been rapid growth in the belief that the course of study entitling students to the LL. B. degree can not be covered properly in less than three years. The president of Western reserve university, Charles F. Thwing writes as follows: "The progress of professional education in the U. S. receives illustration in the fact that a fourth year is now frequently spoken of as a demand of the law school.[2] Many law schools are now doing four years' work in three years, and certain schools are doing three years' work in two years. The best schools have increased their courses of study from two years to three, and as they have increased the length of time they have also increased the number and amount of the studies."

[1] The ratio of lawyers to population in 1870 was 1 to 946, in 1890 it was 1 to 699. These figures show a growth somewhat out of proportion to the growth in population, but not by any means as great comparatively as the growth in students (1870, 1653; 1890, 4518). The explanation is simple. Only students in law schools have been reported, not those prepared for the bar elsewhere.

[2] The law department of West Virginia university requires four years' work for LL.B. degree after July 1, 1899.

In 1875 only 1 law school had a course of three years. In 30 schools the course was two years, in 10 one year, in 2 the length of the course was not stated. In 1899, 44 schools had a three years' course, 37 a two years' course, 4 a one year's course. In 1 the length of the course was not stated. Of the 44 schools with three year's course 11 report an absolute requirement of three years' study in a law school for the LL. B. degree; 30 report three years' study in a law school as the regular requirement for the LL. B. degree.

Of the 86 law schools reporting in 1899, 16 are separate institutions and 70 are departments of colleges or universities; 49 hold day sessions, 24 evening sessions, 7 hold both and 6 do not report the item; 82 grant degrees.

Salaries of teachers — Charles Noble Gregory in a paper read before the American bar association in 1897 showed that of 349 law teachers in the United States, 75 or only about 1-5 gave their entire time to the work. The law teachers who received fixed salaries were as a rule somewhat more highly paid than teachers of other topics even in the same university. The report from Harvard law school was most complete. There we found a faculty of 9 men, all but 1 giving their entire time to the school. The salary of an assistant professor was $2250; of a professor $4000 during the first 5 years, $4500 during the next 5 years, and $5000 thereafter. The average salary of the teachers in American law schools who gave their full time to the work, including deans and assistants, was $2564.12. Replies from European law schools indicated that nearly three times as large a proportion of the law teachers gave their full time.

Methods of instruction — Instruction in law schools is given by lectures, by recitations from textbooks, and by discussion and explanation of selected cases. Each of these systems has its advocates. In a majority of the schools instruction is given mainly by lectures. Next in popularity comes the method of recitations on lessons previously assigned. There are only a few schools that depend mainly on the discussion and explanation of selected cases.

Dean Ashley of the New York university law school writes as follows on this subject: "The leading universities repudiate the idea of any fixed method for teaching or studying law." Professor Gray of Harvard says: "In all law schools, I suppose, the students learn from textbooks, cases and oral instruction. At any rate they do so here. Each teacher is free to use these means as he pleases. The different professors do actually use them in different ways and proportions." Dean Keener of Columbia says: "There is no uniform method of instruction in this school. Each instructor is at liberty to pursue the method of instruction which in his opinion will be productive of the best results. At the present time three methods of instruction are used."

The 1898 report of the committee on legal education of the American bar association gives returns from 20 law schools, including the leading schools of the country, on instruction in practice. 2 report that they depend principally on the observations which the students can make in attending actual courts; but in all others the practical importance of school instruction and of practice in moot courts is recognized. The committee recommends as the ideal plan of organization of a law faculty with reference to practical work that provision be made for a professor of pleading and practice, a thoroughly trained lawyer who shall devote his entire time to work of that kind.

Admission to the bar in colonial days— In early colonial days lawyers seem to have been regarded with jealousy and aversion. At the time of the revolution, however, they had gained a position of prominence which they have always maintained in this country. Of 56 signers of the declaration of independence 25 were lawyers and so were 30 out of 55 members of the convention which framed the federal constitution.[1]

There was no particular scheme of legal education in the colonial period but in most of the colonies there were statutes relating to attorneys. In North Carolina the following

[1] Statistics of J. H. Patton jr.

parliamentary provision was in force up to the revolutionary war:

" . . . None shall from henceforth be admitted attorneys in any of the king's courts of record . . . but such as have been brought up in said courts, or otherwise well practised in soliciting of causes, and have been found by their dealings to be skilful and of honest disposition . . ."

In Virginia in 1680 the licensing of attorneys was placed by the general assembly in the hands of the governor:

" . . . no Person or Persons whatsoever, shall practice as an Attorney or appear to plead in the General court, or any county-court in this countrey, but such as shall be first Licenced by his Excellency, or Successors thereunto, and . . . any one that shall presume to plead in the general court, or any county or other court without such licence first obtained, and had; shall forfeit for every such offence committed in the county-court six hundred pounds of tobacco and in the General Court 2000 pounds of Tobacco."

This act was superseded in 1748 by what seems to be the earliest provision for an examining committee:

" The judges of the General Court shall nominate and appoint such and so many of the council learned in the Law and Attornies practicing in said Court as they shall think fit, to examine into the Capacity, Ability or Fitness of such persons as shall from time to time apply for a licence to practice as Attornies in the County courts and other inferior courts of this colony and shall cause such nomination and appointment to be entered in the Records of their Court; which persons so nominated shall take oath that they will well and truly examine into the Capacity, Ability and Fitness of such persons as shall make application to them for a Licence to practice as Attornies and that they will not grant a Licence to any person who shall not upon examination to the best of their knowledge be found sufficiently qualified to practice as Attorney aforesaid."

In New Jersey any one was allowed to plead till 1698,

after which date attorneys were licensed by the governor. In Massachusetts, Rhode Island and New Hampshire an oath seems to have been all that was demanded of those seeking admission as attorneys. This was the case also in Delaware up to 1726.

The records of the secretary of state at Albany show that for 70 years just preceding the American revolution attorneys were admitted to practise in New York by the governor without any examination as to fitness, though for admission to practise before the supreme court the usual preparation was "a college or university education and three years' apprenticeship or, without the former, seven years' service under an attorney."[1]

In Connecticut attorneys were appointed by the county courts. In Maryland the justices admitted those whom the governor and council had previously licensed. In Pennsylvania attorneys were admitted by the justices; also in South Carolina till 1721, after which date they were admitted by the chief justice of the general and supreme court at Charleston. In all these cases tests as to fitness, if there were any such tests, seem to have been of a very superficial character.[2]

Admission to the bar after the revolution—The New York constitution of 1777 provided that "all attorneys, solicitors and councellors at law, hereafter to be appointed, be appointed by the Court and licensed by the first judge of the court in which they shall respectively plead or practice; and be regulated by the rules and orders of the said courts."

In 1797 the New York supreme court prescribed a seven years' clerkship with a practitioner as one of the requirements for admission as an attorney except in the case of those who after the age of 14 had pursued classical studies for four years or less, such applicants being permitted to deduct the time so occupied from the seven years' clerkship. After four years' practice the attorney was admitted without

[1] William Smith, *History of New York.*

[2] I am indebted to Mr Ashley of the New York state library school for assistance in the study of the colonial records.

further test as a counselor. These rules were modified in 1829 by requiring three years' practice as an attorney and a separate test for the degree of counselor. A few other states had similar requirements.

Under the rules that followed the adoption of the New York constitution of 1846 students were admitted to the bar without any requirements as to period of study or mode of training and without satisfactory evidence as to character. The same laxity prevailed in other states and the law came to be regarded more as an ordinary trade than as a distinct profession. This was the condition of legal education in 1870 when the bar is said to have reached its lowest ebb.

In 1880 most of the states had adopted a system of oral examinations for admission to the bar. These tests were usually held in open court. In about 3-5 of the states any ignoramus could present himself and if successful gain admission to practise before all state courts. The tests at best demanded little knowledge of legal principles; usually they were a farce. 15 states required a definite period of study; 6 gave an allowance in term of study to bachelors of arts; Pennsylvania and Delaware required a preliminary general education; women were admitted in 10 states.[1]

In 1871 admission to the bar in New York was placed under the control of the court of appeals. In 1882 the court adopted a rule requiring all law students unless college graduates to pass an examination as a test of preliminary general education. In 1894 the legislature provided for uniform examinations in all judicial districts, similar in essential features to those adopted in 1878 by the supreme court of New Hampshire. In the latter state from 1812 to 1872 a statute had provided as follows: "*Any* citizen of the age of 21 years, of good moral character, on application to the supreme court, *shall* be admitted to practise as an attorney."

The American bar association has recommended that

[1] In 1899 women are admitted definitely in 15 states and by inference in most political divisions. They seem to be excluded definitely only in Arkansas, Georgia and Indiana.

examinations for admission to the bar be conducted by a commission appointed by the court of last resort, according to the system now in force in New York, Ohio and Illinois. Boards with high standards seem to feel that written examinations afford the fairest test. Oral examinations are certainly impracticable when large classes are to be examined. An attempt is now made to select questions that require the application of legal principles to given facts. All progressive boards are abandoning the plan so prevalent in the past of limiting the tests to petty details and questions of local practice.

At the 1899 meeting of the American bar association, the acting president, Charles F. Manderson, spoke substantially as follows: A notable and encouraging sign of the times, presaging much good to the profession and benefit to the public, is the increased interest felt in the proceedings of the local bar associations. Nearly every state has an active, vigorous organization, and very many of the counties and judicial districts have their societies, composed of the best professional material of the vicinity. The standard of qualifications for admission to the bar has been materially elevated by these associations.

Synopsis of present requirements — In the following political divisions law-school diplomas do not now confer the right to practise law, an examination being required by statute in all cases:

Arizona	Indian ter.	Montana	Oregon
Arkansas	Choctaw nat.	New York	South Dakota
Colorado	Iowa	North Carolina	Utah
Florida	Kentucky	North Dakota	Virginia
Hawaii	Maine	Ohio	Washington
Idaho	Massachusetts	Oklahoma	Wyoming

The following require for admission to the licensing examination:

Colorado, one year high school, two years' clerkship or study in school

Iowa, two full years' study in office or reputable school

Maine, two years', after September 1900 three years' study in office or recognized school

Montana, two full years' study of law

New York, three years' high school course, college graduate two years', others three years' study in office or school

North Carolina, 12 months' professional study

North Dakota, two full years' study with practitioner in this state or in reputable school in U. S.

Ohio, a common school education, three full years' study with practising attorney or in school

Oregon, three years' study of law

Washington, two years' regular study of law

Wyoming, two years', after September 1900 three years' study in law school or office

The following require the licensing examination only:

Arizona	Idaho	Massachusetts	Tennessee
Arkansas	Indian ter.	Oklahoma	Utah
Florida	Choctaw nat.	Oregon	Virginia
Hawaii	Kentucky	South Dakota	

The 16 following states require either approval of law diploma or examination by duly qualified authority:

Alabama	Louisiana	Mississippi	Tennessee
California	Maryland	Missouri	Texas
Georgia	Michigan	Nebraska	West Virginia
Kansas	Minnesota	South Carolina	Wisconsin

The following requiring either approval of diploma or examination admit to examination on:

Kansas, two years' study, the last with attorney

Louisiana, two years' study of law

Maryland, three years' study in school or office

Michigan, between one and two years' high school, three years' study of law

Minnesota, about two thirds year high school, three years' study in office or school

Nebraska, two years' study in office of practising attorney

West Virginia, two years' study of law

Wisconsin, two years' study of law

In 10 states, District of Columbia, New Mexico and Indian territory, Muskogee or Creek nation and Chickasaw nation, and the Philippines admission is governed by rules of court not defined in the law as follows:

Connecticut, examination after high school graduation or indefinite preliminary test, three years' study in a law school or office, two years' study if a college or law school graduate

Delaware, examination after three years' study of law under direction of a member of the bar

District of Columbia, three years' study under competent attorney or in school

Illinois, examination after graduation from three years' high school course, three years of 36 weeks each in approved law school or with licensed lawyers who subject the students to regular examinations in each subject (prior to Jan. 1900 a diploma showing a regular course of two years or an examination on two years' study in an office)

Indian territory, Cherokee nation, the judge or treasurer grants a license

Chickasaw nation, supreme court judges issue a license to any person possessing sufficient law knowledge

Creek nation, a district judge admits to a district court and a supreme court judge to all courts any person of good moral character

[1] Indiana, "every person of good moral character, being a voter, shall be entitled to practise law in all courts of justice." — *Constitution*

Nevada, examination in open court

New Hampshire, examination after three years' study under direction of a counselor of the court

New Jersey, examination after three years' clerkship with degree of B. A. or B. S., or four years' clerkship, one year

[1] A constitutional amendment is to be submitted to the people, which provides that the general assembly shall by law prescribe the necessary qualifications for admission to the bar.

and a half in a law school may count for an equal period in clerkship (exceptions)

New Mexico, examination after two years' clerkship or diploma of law school

Pennsylvania, to supreme court on motion after four years' clerkship and one year's practice in county court or diploma of certain law schools after three years; to county courts under varying conditions

Philippines, "A strict examination in open court . . . by the justices of the supreme court." Those admitted to practise in U. S. courts or in the highest court of any political division may be admitted without examination

Rhode Island, examination after three years in an office or a classical education and two years in an office

Vermont, (old rule) examination after three years with attorney, or one year with attorney and two in office, (rules under 98 law not yet approved)

Alaska has no law. In Cuba and Puerto Rico the requirements are in process of transition.

4 MEDICINE[1]

Apprenticeship system — Before the establishment of medical schools in this country medical students either went abroad to study or served an apprenticeship with some practising physician. The custom of studying with a preceptor was common in view of the expense incident to work abroad, and this custom in a modified form continued till very recently. As a rule the apprentice had little opportunity for study but was forced to depend on what he could absorb by contact with his preceptor. The physicians of the 17th and 18th centuries who had studied abroad were usually classical students and in their preliminary training set an example that it would have been wise to follow.

First public medical lectures — The first public lectures on anatomy before a class of students in this country are said to have been delivered by Dr William Hunter of Newport, R. I. in 1752. It seems, however, that Dr Giles Firmin as early as 1647 delivered readings on human osteology in New England; that Dr Thomas Cadwallader of Philadelphia gave instruction to students in anatomy between 1745 and 1751, and that Drs John Bard and Peter Middleton dissected the human body in New York city in 1750 for purposes of medical instruction. In 1762 Dr William Shippen of Philadelphia gave a course of lectures on anatomy, illustrated by actual dissections. These lectures were continued till the organization of the Medical college of Philadelphia (now the medical department of the University of Pennsylvania) in 1765. Dissections were rarely performed prior to 1760 and even autopsies were seldom permitted.

Early medical schools — At the time of the American revolution, with a population of 3,000,000, there were probably about 3500 physicians in the colonies, of whom it is estimated that not more than 400 had received medical degrees. In New England the clergyman was often the

[1] See Toner's *Annals of medical progress in the United States*, and Davis' *Medical education and medical institutions in the United States.*

only available physician. Two medical schools were organized in the colonies, the Medical college of Philadelphia (now the medical department of the University of Pennsylvania) in 1765, and the medical department of King's (now Columbia) college, in 1768. The first medical degree conferred in this country was that of bachelor of medicine. This degree was granted to 10 men by the Medical college of Philadelphia in 1768. The degree of doctor of medicine was first conferred in 1770 by the medical school of King's college on two students who had taken the bachelor's degree in 1769. 51 medical degrees had been conferred by these institutions before 1776, when operations were suspended by the war. In the colonial period two medical societies (the State medical society of New Jersey, in 1766, and the Delaware state medical society, in 1776) and one permanent general hospital were organized.

Harvard university medical school was organized in 1782, Dartmouth medical college in 1797, the School of medicine of the University of Maryland and the College of physicians and surgeons of New York in 1807. In 1813 the medical department of King's (the name of which had been changed to Columbia) college was finally discontinued. The College of physicians and surgeons became in 1860 the medical department of Columbia university. Of the 156 medical schools now existing in the United States 3 were established between 1765 and 1800, 12 between 1801 and 1825, 22 between 1826 and 1850, 33 between 1851 and 1875, 86 between 1876 and 1900.

At the time of the organization of the early medical schools the practice of obstetrics was relegated as a rule to ignorant midwives; physiology, histology, organic chemistry, pathology and surgery, as now recognized were hardly known. The schools at first conferred the degree of bachelor of medicine on those who had studied two years with a preceptor and attended one course of lectures, the degree of doctor of medicine after three years of study and two courses of lectures. The bachelor's degree was abandoned

in 1813. At first the Medical college of Philadelphia required for admission some knowledge of Greek and Latin, physics, natural history and botany, but the requirement was abandoned about the time of the reorganization of the University of Pennsylvania in 1792. For a century there were as a rule practically no requirements in preliminary general education for admission to medical schools, and even today this is their greatest defect. To the fact that charters for medical schools were to be had for the asking and that those schools were almost wholly self-sustaining is due the multiplication of small schools without facilities for clinical instruction. These schools in their rivalry for fees crowded all instruction into two ungraded lecture courses of from four to five months each. Progressive medical schools were anxious to raise their standards but feared a loss in students. The diploma given as a result of this unsatisfactory instruction admitted to professional practice.

Influence of medical societies — In 1839 the New York state medical society resolved that teaching and licensing ought to be separated as far as possible.[1] In 1837 the same view had been advocated in Philadelphia. Farther discussion of this question led to a call for a convention of delegates from all medical schools and societies in the United States. The convention was held in New York in 1846, and from it sprang the American medical association.

Much has been accomplished by medical societies to elevate the medical profession, specially since the organization of the American medical association in 1846. This national organization, thoroughly representative in character, gave a

[1] Results of licensing examinations show the importance of this question. Under the New York licensing laws, for example, 4808 physicians have been examined, of whom 3722 or 77.5% were successful; 916 dentists have been examined, of whom 712 or 77.7% were successful; 67 veterinarins have been examined, of whom 30 or 44.7% were successful. In these statistics each candidate who fails is counted as often as examined, but nevertheless so large a per cent of rejections is astonishing in view of the fact that admission to licensing examinations presupposes the preliminary education required by statute and also graduation with a degree from a registered professional school. Including those unable to meet the requirements for admission to licensing examinations more than 30% of all applicants have failed to secure licenses.

new impetus to medical societies. In 1876 there was only one state in the Union that did not have a state medical society and many affiliated local associations.

The following societies have exercised an important influence in promoting higher standards:

Association of American medical colleges (1890)
American institute of homeopathy (1844)
National confederation of eclectic medical colleges (1871)
Southern medical college association (1892)

The first and fourth of these societies prescribe for admission to medical schools a preliminary general education equivalent to one year in a high school, the second and third demand work equivalent to two years in a high school. All prescribe four courses of lectures in different years as a condition for an M. D. degree, though they give an allowance of one year to graduates of reputable literary colleges and of other professional schools.[1] All tend to improve facilities for teaching, dissections and clinics. The schools registered by these societies are 72, 21, 6 and 11 respectively.

At the June 1899 meeting of the American institute of homeopathy the legislative committee was requested to draft a model bill with a view to obtaining general uniformity in the laws relating to the practice of medicine, preparatory to the introduction in congress of a general law to secure the right of physicians to practise in all states after being authorized to practise in one.[2]

[1] A bill amending the medical law in this respect passed both houses of the New York legislature in 1897 but unfortunately was not signed by the governor. This bill gave the regents power to accept as the equivalent of the first year of medical study "evidence of graduation from a registered college after four years of general preliminary education in addition to the high school course fixed by law as a minimum, provided that such college course included not less than the minimum required for such admission to advanced standing in languages, physics, chemistry and biology."

[2] A uniform standard for admission to practise throughout the United States is impracticable at present owing to varying conditions as to density of population, educational advantages and general development. Weak states can not maintain the standards demanded elsewhere and strong states can not afford to lower their standards. The present needless multiplication of standards, however, is most unfortunate. Instead of a separate standard for almost each political division, two or at most three standards should answer for all. In the first group should

At the June 1899 meeting of the National confederation of state medical examining and licensing boards the committee on minimum standards for admission to medical schools recommended graduation from a four years' high school course or its equivalent. This committee outlined an alternative examination that represents less than three years of high school work. It also provided for an allowance of the first year of professional study to graduates of reputable literary or scientific colleges after satisfactory examination on the work of the first year.

At the June 1899 meeting of the Association of American medical colleges, a special committee made an interesting report on the condition of medical education in the United States. The committee had corresponded with all the medical schools, 82 in number, which had appeared as members of the association in 1897 and 1898. The replies received from 56 schools show great discrepancy in teaching facilities and in the requirements for graduation. Following are some of the most significant facts:

Laboratory work, including dissections. 1 school makes no report; 1 gives less than 300 hours of laboratory work in four years; 5 give between 300 and 500 hours; 27 between 500 and 1000 hours; 14 between 1000 and 1500 hours; 8 over 1500 hours.

Practical work. 5 schools offer less than 100 hours; 10 give from 100 to 200; 13 from 200 to 300; 11 from 300 to 500; 16 over 500 hours.

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come the strongest states, and the standard maintained by these states would act as a stimulus to weaker political divisions. In dentistry New York, Pennsylvania and New Jersey have already moved in this direction and in medicine there will be a similar movement when the regents have the statutory power on unanimous recommendation of a state board of medical examiners to indorse the licenses of those whose preliminary education and professional training meet the requirements of the New York law. The Wayne co. (Michigan) medical society has addressed a circular to licensing bodies asking 1) if reciprocity with political divisions that have practically the same licensing requirements would be favored, 2) if statutory amendments necessary to secure such reciprocity would be advocated. Sep. 14, 1899 favorable answers to both inquiries had been received from 30 political divisions. With few exceptions statutory amendments would be necessary.

Obstetric cases. 5 schools offer their students no opportunity to attend obstetric cases before graduation; 28 give students opportunity to attend personally from one to three cases; 7 from three to five cases; 6 from 5 to 10 cases; 7 over 10 cases.

Clinical cases yearly available. 3 schools furnish no evidence of having even one patient to present to their students before graduation; 4 have less than 500 patients all told from which to select clinical cases; 4 have less than 1000; 5 between 1000 and 2000; 9 between 3000 and 5000; 8 between 5000 and 10,000; 6 between 10,000 and 20,000; 6 between 20,000 and 40,000; 3 between 40,000 and 100,000.

Minimum number of hours of clinical attendance by each student. 6 schools offer less than 300 hours of clinical work in four years; 6 give only from 300 to 400 hours; 7 from 400 to 500 hours; 19 from 500 to 800 hours; 14 from 800 to 1200 hours; 4 give over 1200 hours.

Didactic work. 2 schools give less than 1000 hours in four years; 7 from 1000 to 1500 hours; 22 from 1500 to 2000 hours; 13 from 2000 to 2500 hours; 4 from 2500 to 3000 hours; 8 give over 3000 hours.

Total number of hours' work demanded of medical students. 3 schools demand less than 2000 hours; 2 from 2000 to 2500; 11 from 2500 to 3000; 7 from 3000 to 3500; 7 from 3500 to 4000; 26 over 4000 hours.

The committee recommended a change in the constitution and by-laws of the association by the adoption of the following:

1 After July 1, 1900, and till more stringent rules be adopted, students beginning the study of medicine must possess a diploma from a high school giving a thorough preliminary education, or must pass a thorough examination in all the branches usually taught in such schools. This examination is to be conducted by a state superintendent of public instruction or some one delegated by him, or by members of the faculty of a university or college, who are not connected with the medical faculty of the school the student wishes to

enter, or by such a body as the regents of the University of the State of New York.

2 Before a student can enter an advanced class he must present certificates from a school whose requirements fully equal those of this association of having successfully passed the examinations in at least three fifths of the branches embraced in the curriculum of the previous years of the school he desires to enter or he must pass examinations on the same; on the remaining branches he may be conditioned, but these conditions must be removed by taking the work, providing it has not already been taken, and by passing examinations before he can pass on to the succeeding class (that is a man shall not carry conditions for more than one year), providing, however, that this shall not prevent schools from allowing students who have earned the B. A. or B. S. degree and who have had an adequate course in science, or graduates in dentistry or pharmacy, who possess the proper preliminary education, to enter the sophomore class.

3 Before a student can be eligible for the degree of doctor of medicine he must have attended in a well-equipped medical school, four courses of lectures of at least six months each. These courses must embrace at least 3300 hours' actual work in the school, including besides didactic lectures and recitations,

a 500 hours of laboratory work;

b 150 hours of practical work;

c One or more obstetric cases personally attended by each student;

d 750 hours of clinical teaching.

At least 45 months must intervene between a student's matriculation and the date of his graduation. All of the work should be fairly apportioned throughout the four years.

4 No school can be considered capable of giving the requisite instruction that can not command each year at least 3000 hospital or dispensary patients for presentation to its classes.

Medical sects — As commonly understood, regular physicians have no distinctive theory or practice; homeopaths treat diseases with drugs that excite in healthy persons symptoms similar to the morbid condition treated; eclectics make use of what they regard as specific remedies, chiefly botanical; physiomedicalists use only botanical remedies, discarding those which are poisonous. In practice these distinctions are not always observed.

In addition to the medical sects to which detailed reference is made in this work a number of *pathies* flourish in many states unmolested under such names as osteopath, vitapath, electropath, hydropath, divine healer, magnetic healer, Christian scientist, faith curist, mind curist, sun curist, etc. Men and women without preliminary or professional training treat diseases under these or similar systems to such an extent that the health of the people is endangered. These so-called systems are followed with impunity in many states in what seems to be open violation of laws restricting the practice of medicine. This is due largely to the fact that so many statutes lack specific definitions as to what constitutes the practice of medicine, and without these definitions the conviction of such practitioners can not be secured through the courts.[1]

Osteopathy was "discovered" in 1874. It is based on the theory that "a natural flow of blood is health" and that the bones may be "used as levers to relieve pressure on nerves, veins and arteries." Osteopathy is now recognized by law in Iowa, Michigan, Missouri, North and South Dakota, Tennessee and Vermont. Practice of "the system, method or

[1] In Illinois the medical practice act provides special state examinations in obstetrics for midwives, and in anatomy, physiology, physiologic chemistry, histology and pathology and hygiene for those desiring to practise systems of treating human ailments in which medicines are not used internally or externally and operative surgery is not followed. The act does not apply, however, to any person who "treats the sick or suffering by mental or spiritual means, without the use of any drug or material remedy." It is encouraging to note that notwithstanding this broad exemption Justice Everett of Chicago ruled against "divine healing" in August 1899. If his opinion is sustained in the higher court the "Zion curers" can no longer practise the "laying on of hands."

science of osteopathy" is restricted to licensed physicians and to graduates of "a legally chartered and regularly conducted school of osteopathy." The use of drugs and operations in "major or operative surgery" are not permitted in the practice of osteopathy.

In Georgia, Kentucky, Nebraska, New Jersey, New Mexico, Montana, Ohio[1] and West Virginia there are stringent laws against non-medical practitioners. In some other states, like Illinois, they receive such legal protection that any person may treat "the sick or suffering by mental or spiritual means, without the use of any drug or material remedy." Under these conditions any person in Connecticut, Maine, Massachusetts and New Hampshire is free to practise "the sun cure, mind cure, hypnotism, magnetic healing, Christian science, etc." The greater part of New England[2] seems to be on about the same footing in this respect with the Cherokee nation, Indian territory, where entire liberty is given to "enchantments in any form." In striking contrast Hawaii inflicts heavy fines on any person convicted of an attempt to cure "another by practice of sorcery, witchcraft, anaana, hoopiopio, hoounauna, hoomanamana, etc."

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[1] In spite of this the court (6 Ohio Dec. 296) held in January 1897 that an osteopath was not practising medicine by kneading and manipulations, using only his hands and no medicines. In Kentucky and West Virginia, however, the courts have upheld the statutes which provide that manipulations or other expedient shall constitute the act of practising medicine. In Nebraska the court (40 Neb. 158) ruled in 1894 that the "object of the statute is to protect the afflicted from the pretensions of the ignorant and avaricious, and its provisions are not limited to those who attempt to follow beaten paths and established usages." In Americus, Georgia in 1899 six prominent citizens, Christian scientists, were sentenced to fines and imprisonment for refusing to submit to vaccination.

[2] In *Customs and fashions in old New England* Alice Morse Earle tells us that in "1631, one Nicholas Knapp was fined and whipped for pretending 'to cure the scurvey by a water of noe worth nor value which he sold at a very deare rate.'" One is almost tempted to suspect that this whipping took as much out of the New England officials as it did out of Mr Nicholas Knapp, for since that remote date scarcely a rumor has reached us of any equally vigorous remonstrance with unqualified practitioners. As a result New England has been a specially promising field for quacks, not many of whom were considerate enough to follow the example of the celebrated "rain water doctor." Of this worthy it is recorded that he "worked wondrous miracles and did a vast and lucrative business" till he opportunely ended his career by tumbling into a hogshead of his own medicine.

There is much misunderstanding in this country regarding the duty of the state in relation to the health of the people. It does not consist in discriminating between schools or systems of medicine, but in requiring without prejudice or partiality of all who seek a license to practise for gain on the lives of fellow beings a minimum preliminary and professional training.[1]

Midwifery — Special tests for certificates of registration as midwives are required in:

Arizona	Illinois	Louisiana	Puerto Rico
Connecticut	Indiana[2]	New Jersey	Utah
Dist. of Col.	Iowa	Ohio	Wyoming

In the following political divisions the provisions of the medical practice acts do not apply to women engaged in the practice of midwifery:

Alabama	Kentucky	New Mexico	Texas
Arkansas	Maine	North Carolina	Vermont[3]
Florida	Maryland	Rhode Island	Virginia
Georgia	Mississippi	South Carolina	Washington
Idaho	Montana	Tennessee	West Virginia

In other political divisions, though there are some special provisions for certain localities, the general acts regulating the practice of medicine make no reference whatever to the practice of midwifery by women.[4] It would seem, therefore, that these laws restrict the practice of midwifery to

[1] In the November 1898 *Medical record*, W. A. Purrington of New York asks if we are to punish the physician who fails to report contagious diseases and allow a person who boasts his ignorance of medical and sanitary science to treat and conceal such cases. Medical laws provide only, at most, that no person shall practise medicine who has not studied medicine; a licentiate may practise as he pleases. But there is no reason why unqualified persons should be allowed to pretend to cure disease, by their pretenses deprive the sick of the benefits of science, and yet escape the just consequences of their imposture.

[2] Either examination or approval of diploma.

[3] Those practising midwifery without a certificate can not enforce collection of fee, but this does not apply to the practice of midwifery by women in the town or locality in which they reside.

[4] In Nebraska, North and South Dakota the practice of "medicine, surgery or obstetrics" without a license is prohibited.

licensed physicians. Nevertheless a large proportion of the children in these political divisions are brought into the world by ignorant midwives, and as stated by Dr M. J. Lewi of New York, many women are physical wrecks through their incompetence. Practically the conditions in political divisions where the laws seem to restrict the practice of midwifery to licensed physicians are little better than in political divisions where the practice of midwifery by women without a license is authorized by statute. There will probably be little change for the better till the midwife receives legal recognition and the practice of midwifery is regulated by definite statutory provisions.[1]

Graded system of instruction — In 1859 the Chicago medical college, now the medical department of Northwestern university, was established to test the practicability of a thoroughly graded system of instruction. Students were divided into three classes, and each class was examined at the close of the year. Each of the three courses was six months in duration. Attendance on hospital clinical instruction and practical work in the chemical, anatomic and microscopic or histologic laboratories were required for graduation. In 1871 the Harvard medical school adopted a similar plan. The Syracuse medical school followed and today the graded system of consecutive lectures is the rule.

In 1896 Pres. Eliot wrote substantially as follows: Within 25 years the whole method of teaching medicine has been revolutionized throughout the United States. The old medical teaching was largely exposition; it gave information at long range about things and processes which were not within reach or sight at the moment. The main means of instruction were lectures, surgical exhibitions in large rooms appropriately called theaters, rude dissecting rooms with scanty supervision, and clinical visits in large groups. The lectures were repeated year after year with little change, and

[1] In New York no agreement has yet been reached regarding a midwifery statute. At the November 1899 meeting of the Federation of women's clubs a resolution favoring the licensing of trained nurses by the University of the State of New York was adopted.

no graded course was laid down. There was little opportunity for laboratory work. The new medical education aims at imparting manual and ocular skill, and cultivating the mental powers of close attention through prolonged investigations at close quarters with the facts, and of just reasoning on the evidence. The subjects of instruction are arranged, as at the Harvard medical school, in a carefully graded course, which carries the student forward in an orderly and logical way from year to year. Laboratory work in anatomy, medical chemistry, physiology, histology, embryology, pathology and bacteriology demands a large part of the student's attention. In clinical teaching, also, the change is great. Formerly a large group of students accompanied a visiting physician on his rounds, and saw what they could under very disadvantageous conditions. Now instruction has become, in many clinical departments, absolutely individual, the instructor dealing with one student at a time, and personally showing him how to see, hear, and touch for himself in all sorts of difficult observation and manipulation. Much instruction is given to small groups of students, three or four at a time — no more than can actually see and touch for themselves.

Medical schools and medical students in 1899 — In 1899 there were excluding graduate schools 156 medical schools in the United States with 24,119 students. The growth in medical students in 21 years has been 142 per cent. Of the 156 schools 125 are regular[1] (21,619 students), 21 homeopathic (1833 students), 7 eclectic (582 students), and 3 physiomedical (85 students).

Of the 156 medical schools, 135 hold day sessions, 5 have evening sessions, 9 have both and 7 do not report this item. 74 are departments of colleges or universities, 82 are separate institutions. 152 grant degrees.

In addition to the undergraduate schools there are 8 graduate medical schools which had in 1898, 624 instructors

[1] The name commonly applied to the traditional school of medicine. Other designations are the "old," "allopathic" or "heteropathic" school.

and 1813 students of whom 59 were women. In 1899 these schools had 1916 students of whom 73 were women. Nearly half of the students were in the New York schools.

The ratio of physicians to population is 1 to less than 600 in the United States while in foreign countries it varies from 1 to about 1100 in the British isles to 1 to about 8500 in Russia. We are said to have in proportion to our population four times as many physicians as France, five times as many as Germany, six times as many as Italy.

There are more medical schools in the United States alone than in countries whose total population is six times as great, and yet few of these medical schools in the United States have endowments corresponding to those so lavishly made to other educational institutions or in any way proportioned to their needs. Fortunately the closing years of this century seem to indicate a change in the attitude of philanthropists toward medical schools. In 1897, 14 medical schools reported endowments of $648,262. In 1898, 19 medical schools reported endowments of $1,906,072.[1] In New York the advanced requirements for license have been accompanied by extraordinary growth in the property of medical schools, specially in greater New York. A fine building was erected in 1897 by the faculty of the Bellevue hospital medical college. The College of physicians and surgeons, with the Vanderbilt clinic, doubled in size by the additional gift in 1895 of $350,000, and the Sloane maternity hospital, greatly enlarged in 1897, now make the most complete plant in existence for scientific medical education. The Polhemus memorial clinic has been completed and thoroughly equipped, providing accommodations for the outpatient and medical school departments of the Long Island college hospital. In the medical division of the Flower hospital, opened in 1896, the New York homeopathic medical college now gives excellent opportunity for the study of practical medicine. The New York medical college and

[1] From 1894 to 1898 the most notable gifts and bequests amounted to $2,631,000 for medical schools and $16,593,701 for hospitals.

hospital for women opened in 1898 its handsome building in West 101st street. An amount reported at $1,500,000 was given in 1898 to build, equip and endow the new medical department of Cornell university in New York city.[1]

Hygiene and state medicine — More attention should be paid in the United States to instruction in hygiene and state medicine. In Great Britain no one can be appointed a medical officer unless he has a special diploma in public health. In this country little opportunity is afforded for general or special sanitary work on broad lines. This subject is now under discussion and doubtless progressive states will soon provide places where medical officers of health or other persons engaged in sanitary work can obtain practical and scientific training. The scientific investigations which would be made in the laboratories of such schools would be of great value to the public.

In *Medical education of the future*, an essay in *Educational reform* which every thoughtful man should read, Pres. Eliot writes: "State medicine has many objects in view. It aims not only to protect the public health, but also to increase it. In state medicine individualism is impracticable for it is impossible for the individual to protect himself. The social cooperation, which in our days the state alone can enforce, is needed to promote security against disease and progress toward better average health and longer life. To take all possible precautions against the spread of infectious diseases is simply an act of good citizenship. Nothing but medical supervision will accomplish the objects of state medicine; and there are no agents so effective as physicians to spread through all classes of the community an educated sense of sanitary decency. Only the state can guard against dirty milk, corrupted water-supplies, impure ice, adulterated drugs, spoilt meat and fruit, and filthy and over-crowded tenements. Only the state can enforce the isolation of cases of contagious disease, the suppression of epidemics, and the

[1] Our medical school will be splendidly housed and endowed. Any statement beyond this is purely unofficial.—*Pres. Schurman*, Sep. 27, 1899.

exclusion of pestilences like cholera and yellow fever. In exercising such control the state needs every aid which medical experts in chemistry, bacteriology, and comparative pathology can place at its disposal. The medical profession itself hardly recognizes as yet how great promise there is in the further study of the connections between diseases in animals and in man — connections which smallpox, scarlatina in cows, tuberculosis in men and animals, and diphtheria already illustrate. Not even the state — that is, a single state or nation — can deal effectively with such a problem as the suppression of cholera or yellow fever. That is an international problem. The evils which the social and gregarious instincts of men create, by inducing the modern crowding into cities, must be socially remedied; and the most effective force which society can exert to this end is the influence of the highly trained medical officer. Every physician should be a medical philanthropist and missionary, zealous to disseminate knowledge of public hygiene."

Present tendencies — Dr Bayard Holmes, secretary of the Association of American medical colleges, writes as follows touching present tendencies in medical education:

"Two stages of educational development are already manifest in the medical schools of the United States. About half the schools have finished the first stage and are entering on the second, while the remainder are laboring tardily to complete the first. In the first stage of development, from the medieval lectures on the 'seven branches of medicine,' the course of study has been lengthened, some entrance requirements instituted and the number of distinct and separate studies greatly increased. Laboratory and recitation work have been introduced, written examinations have been made frequent, once a month or oftener, and a sort of graded medical school established. In this condition are most of the schools that maintain the standard established by the Association of American medical colleges.

Some few schools, however, have already outgrown this system of educational lock-step and are organizing a cur-

riculum adapted to the needs of students of differing tastes or abilities. This curriculum is planned not to instruct but to educate; not from the standpoint of the teacher's convenience, but from that of the student's advantage. The first stage of educational development multiplied the teachers, scattered the energies of the student (in some cases requiring him to go before 10 different professors each week) and dissociated related topics. The second stage of development early introduces the student to the study of the live man, makes continuous clinical study on single cases by each of the students a means of unifying the whole curriculum, and requires thesis work of each student, necessitating on his part clinical, laboratory, experimental and library work on the same subject. This introduces intensity in the place of diffuseness; independence in the place of subordination and original investigation in the place of catechism. To assert that the elective method for any large part of the medical curriculum is already established in any considerable number of medical schools, would be misleading, but this is certainly the tendency of the day.

The growth of medical libraries in the medical schools, the establishment of thoroughly equipped accessory laboratories, the publication of bulletins and theses and the numerous articles on medical pedagogy written by active medical teachers testify to the intense struggle for the liberation of the medical student and the medical teacher from the iron-clad course of study. When this second stage of development has been realized, the medical schools will do more than furnish quiz classes, preparatory to state board and hospital examinations; they will become fountains of original investigation pouring out every year both well-trained medical men, and large and important contributions to medical science, these contributions produced as a means to a rational education."

Early legislation — The earliest law relating exclusively to physicians was passed by Virginia in 1639, but like the later act of 1736 it was designed mainly to regulate their fees.

The act of 1736 made concessions to physicians who held university degrees. In only 2 of the 13 colonies were well-considered laws enacted to define the qualifications of physicians. The general assembly of New York in 1760 decreed that no person should practise as physician or surgeon in the city of New York till examined in physic and surgery and admitted by one of his majesty's council, the judges of the supreme court, the king's attorney-general and the mayor of the city of New York. Such candidates as were approved received certificates conferring the right to practise throughout the whole province, and a penalty of £5 was prescribed for all violations of this law. A similar act was passed by the general assembly of New Jersey in 1772.

In 1840 laws had been enacted by the legislatures of nearly all the states to protect citizens from the imposition of quacks. Between 1840 and 1850, however, most of these laws were either repealed or not enforced as a result of the cry that restrictions against unlicensed practitioners were designed only to create a monopoly.

Synopsis of present requirements — In the following political divisions medical diplomas do not now confer the right to practise medicine, an examination being required in all cases:

Alabama	Illinois	Minnesota	Oregon
Arizona	Indian ter.	Mississippi	Pennsylvania
Connecticut	Cherokee nat.	Montana	South Carolina
Delaware	Iowa	New Hampshire	Utah
Dist. of Col.	Louisiana	New Jersey	Vermont
Florida	Maine	New York	Virginia
Georgia	Maryland	North Carolina	Washington
Hawaii	Massachusetts	North Dakota	West Virginia
Idaho			

In some tables Texas is classed with the states in which diplomas confer no right to practise, but the Texas laws conflict.

The following require for admission to the licensing examination:

Alabama, requirements of State medical association

Arizona, diploma from recognized medical school

Delaware, competent common school education, diploma from legally incorporated medical school

District of Columbia, diploma of school authorized by law to confer M.D. degree

Florida, diploma from recognized medical school

Georgia, diploma from legally organized medical school

Idaho, diploma from legally chartered medical school

Illinois, less than one year of high school work, diploma from approved medical school

Indian territory, Cherokee nation, diploma from reputable medical school

Iowa, less than one year of high school work, diploma from recognized medical school

Louisiana, fair primary education, diploma of recognized medical school

Maryland, common school education, diploma from legally incorporated medical school

Minnesota, four full courses of lectures at recognized medical school

Montana, diploma from legally chartered medical school

New Hampshire, full high school course or its equivalent, diploma from regularly organized medical school

New Jersey, common school education, diploma from legally incorporated medical school

New York, four years' high school course or its equivalent, diploma from registered medical school

North Carolina, diploma from medical school in good standing (after Jan. 1, 1900)

North Dakota, 3 six months' lecture courses

Pennsylvania, common school education, diploma from legally chartered medical school

South Carolina, diploma of recognized medical school

Utah, diploma from chartered medical school in good standing

Vermont, high school course or equivalent and diploma from a U. S. medical school

Virginia, evidence of a preliminary education

The following require the licensing examination only:

Connecticut	Massachusetts	Oregon	West Virginia
Hawaii	Mississippi	Washington	
Maine	North Carolina (diploma after 1900)		

The following require approval of medical diploma by duly qualified boards:

California	Kentucky	Nebraska	Ohio	South Dakota

The following require either approval of medical diploma or examination by state or other duly qualified boards:

Arkansas	Creek nat.	Nevada	Rhode Island
Colorado	Indiana	New Mexico	Wisconsin
Indian ter.	Michigan	Oklahoma	Wyoming
Choctaw nat.	Missouri	Tennessee	

The following requiring either approval of medical diploma or examination, admit to examination on:

Arkansas, a good literary education

Nevada, five years' practice in the state just prior to act or diploma from reputable school without the United States

Oklahoma, full course of lectures

Kansas requires only presentation of diploma or other certificate of qualification to unqualified local officer

Alaska has no law. In Cuba, the Philippines[1] and Puerto Rico[2] the requirements are in process of transition.

The following political divisions have mixed examining boards, that is the boards are composed of representatives of the several schools of medicine:

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[1] The assistant secretary to the military governor in the Philippines writes Sep. 4, 1899 that "the Spanish law as to admission to practise still governs. In general this requires a diploma from a reputable college, school or university of such profession, or in lieu thereof an examination."

[2] General Davis established Sep. 30, 1899 in Puerto Rico an examining committee for licenses to practise medicine, dentistry, pharmacy, midwifery and professional nursing. Only those with satisfactory credentials are admitted to examination.

Alabama	Kentucky	New Jersey	South Dakota
Arizona	Maine	New Mexico	Tennessee
Arkansas	Massachusetts	North Carolina	Texas
Colorado	Michigan	North Dakota	Utah
Hawaii	Minnesota	Ohio	Virginia
Idaho	Mississippi	Oklahoma	Washington
Illinois	Missouri	Oregon	West Virginia
Indian territory	Montana	Rhode Island	Wisconsin
Indiana	Nebraska	South Carolina	Wyoming
Iowa	Nevada		

The following have separate examining boards for each recognized school of medicine:

California	Dist. of Col.	Louisiana	New York
Connecticut	Florida	Maryland	Pennsylvania
Delaware	Georgia	New Hampshire	Vermont

Alaska and Kansas have no examining boards.

5 DENTISTRY[1]

Independent dental schools — From the earliest times dentistry was practised as a branch of surgery. Herodotus speaks of means of preserving the teeth, and artificial teeth are alluded to by Greek and Latin poets. Within the last half century dentistry has become a distinct profession. John Greenwood who carved in ivory a set of teeth for George Washington is said to have been the first American to establish himself as a dentist. His office was in New York and the work for Gen. Washington was done in 1790 and 1795.

The Baltimore college of dental surgery, established in 1839, was the first institution of the kind in the world. It was the direct result of an agitation to put dentists on a higher professional plane, and followed an unsuccessful attempt to found dental chairs in medical schools. It had been argued that oral pathology and dental mechanics should be taught in the medical schools as branches of medicine and that graduates choosing these courses should receive the degree of M. D. as in the case of other branches of medicine.[2] In the same year the *American journal of dental science*, the first dental periodical in the world, was established.

In 1845 the Ohio college of dental surgery (since 1888 the dental department of the University of Cincinnati), in 1856 the Pennsylvania college of dental surgery, in 1863 the Philadelphia dental college were founded. These separate schools taught at first very little medicine but paid attention almost entirely to mechanical training and to those branches which a dentist must know. All conferred the degree of D. D. S. In 1865 the New York college of den-

[1] See Shepard's Inaugural address at the World's Columbian dental congress.

[2] Dr William Carr of New York writes substantially as follows: Dentistry should be recognized as a specialty of medicine, and the dentist should hold a degree in medicine. The education of a physician is as necessary to one who undertakes the treatment of lesions, maladies and defects within the oral cavity as to one whose treatment is confined to the tracts of the nose, the ear and the throat.

tistry was founded with the purpose of educating men to practise dental surgery as a specialty of medicine. The curriculum included the fundamental departments of medicine with operative dentistry and oral prosthetics.

Dental departments — In 1867 Harvard university opened a dental department and began to teach dentistry as a branch of medicine with the special degree D. M. D. (Dentariae medicinae doctor). In 1875 the University of Michigan and in 1878 the University of Pennsylvania followed the example of Harvard in opening dental departments. 36 of the 56 dental schools are now departments of other institutions.

Growth — Since 1878 there has been a most astonishing increase in dental schools and dental students, due largely to the fact that the dental laws in many states now require graduation from a dental school as a condition for license. In 1878 there were 12 schools and 701 students; in 1899 there were 56 schools and 7633 students. The growth in dental students in 21 years has been 988 per cent. Of the 56 dental schools now existing in the United States, 2 were established between 1826 and 1850, 7 between 1851 and 1875, 47 between 1876 and 1900.

47 dental schools hold day sessions, 4 evening sessions, and 5 do not report this item. Degrees are granted to graduates of all schools.[1]

Discoveries and inventions — The discovery of the anesthetic power of drugs, the most important step in the progress of medicine, was made by an American dentist William Jennings Morton, though the honor of this discovery is shared with another dentist Charles W. Wells of Hartford, Ct., who in 1844 rendered the extraction of teeth painless by the use of nitrous oxid. In his *History of European morals* Lecky says: "It is probable that the American inventor of the first anesthetic has done more for the real

[1] Graduates of the New York dental school receive degrees through the University of the State of New York which also countersigns the degrees of the New York college of dentistry.

happiness of mankind than all the philosophers from Socrates to Mill."

Between 1850 and 1860, the use of crystal gold and the discovery of the cohesiveness of freshly annealed foil opened a new field for operative dentistry. The next decade witnessed the introduction of such improved instruments as the mallet, the rubber dam and the engine. The invention of the modern artificial crown and the bridge is another important event of about this period. In the 20 years just preceding 1893 more than 100 different crowns and bridges are said to have been invented.

Dental societies — In 1840 the American society of dental surgeons, the pioneer of the associations to which dentistry owes so much of its progress, was organized in New York.

The National association of dental faculties, organized in 1884, has done much to strengthen courses of study in dental schools. At the time of its organization only those schools were admitted which had proper facilities for instruction and a corps of competent teachers. From time to time standards have been raised by rules governing attendance, instruction and graduation. There are at present 47 schools in the association, all of which require three full courses of dental lectures. The main defect of these schools as a rule is failure to require a sufficient preliminary general education for admission. The efforts of the association in this direction have not accomplished much as yet.

The National association of dental examiners,[1] organized in 1883 to secure higher and more uniform standards for admission to dental practice voted in 1898 to refuse recognition to any dental school that did not have 1) entrance requirements equivalent to at least two years of high school work, 2) attendance on three courses of lectures of at least

[1] At its July 1899 meeting this association created an advisory committee to promote uniformity in administering dental laws. Dr H. J. Allen, secretary of the committee, writes November 15, 1899 for "a comprehensive report from the New York examiners, as the entire committee regards the New York dental law as the best in the country." Dr Allen states that boards in about 15 states have agreed to enter this compact to secure uniform standards.

six months each in different years as a condition for graduation, 3) a faculty of at least six, 4) a course of study embracing operative dentistry, dental pathology, dental prosthetics, oral surgery, anatomy, physiology, general pathology, materia medica, therapeutics and general surgery, 5) suitable chemical and bacteriologic laboratories under competent instructors, 6) suitable lecture rooms, a well-appointed dental infirmary and a general prosthetic laboratory. These rules were not approved by the National association of dental faculties and efforts to enforce them proved unsuccessful.[1]

A joint meeting of committees of these two national associations was held at Niagara Falls in 1899, and it is probable that both will now work harmoniously toward higher standards, the progress to be made by degrees. The committees agreed on one year of high school work as the minimum requirement for admission to dental schools and by vesting the determination of this requirement in the hands of state superintendents of education they recognized the importance of removing this power from those who might exercise it unwisely through a desire to attract students. The motion of Dr Barrett to extend the requirement to two years of high school work after the session of 1901–1902 is to be acted on at the 1900 meeting of the National association of dental faculties. Other requirements of this association, as printed in the new rules, are the same as those given above under the National association of dental examiners except that each course of lectures is to be seven months in duration and general surgery is not mentioned as a special topic.

Subjects discussed — Among the subjects which have attracted much attention recently in dental literature and dental societies are the increasing use of plastics and of porcelain, the modification in practice through laboratory

[1] In 19 political divisions the latest prescribed preliminary and professional requirements are those of the National association of dental examiners, in 4 political divisions those of the National association of dental faculties. Differences between these associations having been adjusted their requirements will probably become uniform.

investigation, the germ theory of disease, antiseptics, the uses of electricity and the tendency of prophylaxis to develop along physiologic lines by attention to the laws of health. Among important topics discussed by the National association of dental faculties the undue multiplication of dental schools without proper facilities and detrimental effects of scholarships have been prominent.[1]

The question of interchange of licenses has been discussed frequently during the last few years. The correspondent of the New York state dental society at the May 1899 meeting submitted a proposition that all state boards, members of the National association of dental examiners, use identical question papers prepared by a committee of the national body, and that licenses granted as a result of such examinations be interchangeable among the states represented in the National association. This scheme had been submitted to dental examiners throughout the country and had been approved by most of those from whom replies had been received.

Interchange of licenses is highly desirable and will doubtless be brought about to some extent in the near future. An examination, however, should not be made the only test. A reasonable preliminary general education and a diploma from an accredited school should be required for admission to the final test which should be both theoretic and practical, and should be carefully guarded from danger of fraud or indirection.

An important step toward interchange of licenses was taken in 1898 when the New York dental law was amended so that the regents may now issue their license to any applicant who holds a license to practise dentistry granted by a state board of dental examiners, indorsed by the dental society of the state of New York, provided that his preliminary and professional education meets the New York statu-

[1] This association voted August 1, 1899 that no school in the association should grant free or beneficiary scholarships not absolutely obligatory under charter provisions.

tory requirements. The dental examiners of New Jersey and Pennsylvania having been indorsed by the New York state dental society as more nearly approximating the New York standard than any other state boards, the New York state dental examiners, at a meeting held Oct. 7, 1899 recommended to the regents the indorsement of New Jersey and Pennsylvania licenses granted under the new plan, provided the preliminary and professional education of applicants meets the New York statutory requirements. The regents will probably act favorably on the recommendation if the New Jersey and Pennsylvania boards agree to establish a standard in preliminary general education fully equal to that required by the New York law.[1]

Legislation — In Alabama in 1841, the first state law regulating the practice of dentistry was enacted. This was probably the first dental legislation in any country. The next state to pass a dental law was New York, but this action was not taken till 1868. The English law was enacted in 1878, and those of other countries about that time or later.

The practice of dentistry is now regulated by statute in almost all political divisions of the United States.

Synopsis of present requirements — In 23 states dental diplomas do not now confer the right to practise, an examination being required in all cases:

Alabama	Connecticut	Florida	Idaho
Colorado	Delaware	Georgia	Maine

[1] The New Jersey statute demands "a preliminary education equal to that furnished by the common schools." The secretary of the New Jersey dental commission writes Oct. 17, 1899 that this has been construed to mean graduation from a registered four years' high school course. "We have, however, agreed to require only a three years' high school course up to Jan. 1, 1901 when the full requirement shall take effect simultaneously with New York. This agreement is made with the full knowledge and approval of the governor and the superintendent of public instruction and you may rest assured that New Jersey will live up to the spirit as well as the letter of the agreement . . . We look on the interchange of licenses with New York as the greatest educational advance that has yet been made in the dental profession, the formation of a nucleus around which all other states must rally."

Massachusetts	New Jersey	Pennsylvania	Virginia
Minnesota	New York	Rhode Island	Washington
Mississippi	North Carolina	South Carolina	West Virginia
New Hampshire	Oregon	Vermont	

The following require for admission to the licensing examination:

Colorado, diploma from legally organized reputable dental school

Connecticut, diploma from recognized dental school, or three years' instruction or three years' practice

Delaware, diploma of recognized dental school

Florida, diploma from reputable dental school

Georgia, diploma from reputable dental school

Idaho, three years' experience, certificate from another state board, or diploma from legally organized dental school

Minnesota, diploma from reputable dental school, or evidence of 10 years' continuous practice previous to September 1889

New Jersey, common school education, diploma from recognized dental school or a written recommendation from five experienced dentists

New York, full high school course, degree from registered dental school or medical degree with a special one year's dental course

Oregon, diploma from dental school in good standing, or study and practice in Oregon prior to this act

Pennsylvania, good common school education, diploma of recognized dental school

Virginia, a fair academic education

Washington, diploma from recognized dental school or evidence of 10 years' practice

The following require the licensing examination only:

Alabama	Mississippi	Rhode Island	Vermont
Maine	New Hampshire	South Carolina	West Virginia
Massachusetts	North Carolina		

In the following political divisions either approval of dental diploma or examination by state or other duly qualified board is required:

Arizona	Kansas	Montana	Oklahoma
California	Kentucky	Nebraska	South Dakota
Dist. of Col.	Louisiana	Nevada	Tennessee
Hawaii	Maryland	New Mexico	Texas
Illinois	Michigan	North Dakota	Utah
Indiana	Missouri	Ohio	Wisconsin
Iowa			

The following requiring either approval of diploma or examination, admit to examination on:

Iowa, satisfactory evidence of three years' study

Missouri, three years' study with legally registered dentist or license from another state

Montana, three years' practice or three years' study under licensed dentist

North Dakota, three years' active practice or three years' study with practitioner

Utah, two years' practice or two years' study under licensed dentist

Arkansas requires only a diploma approved by the board

One state, Wyoming, requires only presentation of diploma to unqualified local officers

In Cuba, the Philippines[1] and Puerto Rico[1] the requirements are in process of transition

Alaska and Indian territory have no laws

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[1] See note under medicine.

6 PHARMACY

Early schools of pharmacy — The first meeting in this country to consider the question of systematic pharmaceutic education was held in Philadelphia in 1821. At this meeting the apothecaries of Philadelphia formed a society to provide a system of instruction in pharmacy and to regulate the conduct of their business. The outcome of this action was the Philadelphia college of pharmacy, which was chartered by the Pennsylvania legislature in 1822. The school opened in 1821–22 with a course of lectures on materia medica and pharmacy, and a course on pharmaceutic and general chemistry. The first class was graduated in 1826. In the early years of the institution committees were appointed to expose adulterations of drugs and a library and cabinet were established. The need of a medium of publication was soon felt. In 1825 the *Journal of the Philadelphia college of pharmacy* was started, which became in 1835 the *American journal of pharmacy*.

The Philadelphia college of pharmacy was followed in 1823 by the Massachusetts college of pharmacy, in 1829 by the New York college of pharmacy, in 1838 by the department of pharmacy of Tulane university, in 1841 by the Maryland college of pharmacy.

Prior to 1840 pharmacists were not recognized in pharmacopœial conventions. In 1850 the chartered schools were invited to send delegates to the decennial convention. In that revision and in the revisions of 1860, 1870 and 1880 pharmacists were well represented. In the convention of 1890, 16 of the 26 members composing the committee on final revision were pharmacists.

Growth — There has been a remarkable increase in schools of pharmacy and students of pharmacy in the past 21 years. In 1878 there were 13 schools with 1187 students. In 1899 there were 52 schools, with 3563 students. The increase in students in 21 years has been 200 per cent. 36 of these

schools maintain day sessions, 9 have evening sessions, 4 have both, 3 do not report this item. 14 are separate institutions, 38 are departments of other institutions. 45 grant degrees. 2 of the 52 schools were established between 1801 and 1825, 4 between 1826 and 1850, 8 between 1851 and 1875, 38 between 1876 and 1900.

Apprenticeship — The University of Michigan is said to have been the first institution in this country to graduate pharmacists without any practical experience. In 1898, 24 schools of pharmacy reported that they did not require any practical training. The original object of the early schools of pharmacy was to give a theoretic knowledge of pharmacy as a science and a higher degree of familiarity with botany and chemistry than could be attained in the limited term of apprenticeship. It was not intended that these schools should take the place of an apprenticeship in a pharmacy.

In recent years there has been no little discussion as to whether schools of pharmacy should require work with a druggist as a condition for graduation. The schools that do not exact this requirement admit its necessity to success as a pharmacist, but they claim that it is impracticable to determine whether or not the necessary practical training has been acquired by their matriculates, and that by providing under proper instructors suitable laboratory facilities for actual work with the drugs, they can give more practical experience than that afforded in many pharmacies where the prescription department is of little importance. There is force in this position in the case of schools that give thorough courses requiring the full time of students, specially if matriculation requirements insure a fair general preliminary education. Dr Gregory, dean of the Buffalo college of pharmacy writes as follows touching this matter: "Prior to 1880 the diploma of a school of pharmacy was generally the sole evidence of fitness as a pharmacist. Now the license is demanded. No one denies the value of experience in a pharmacy, but the responsibility of testing its character

now rests with boards of examiners, leaving the schools free to attend to the primary function of teaching."[1]

Present tendencies — Dr A. B. Huested of the New York pharmacy board writes as follows touching present tendencies in the teaching of pharmacy:

"These tendencies are all in the line of advancement, in teaching more thoroughly the fundamental subjects of chemistry, pharmacy, materia medica and botany, and including the allied subjects, microscopy, analytic examination of medicines, foods, secretions and excretions of the human system and bacteriology. In the past, the instruction in all schools of pharmacy was confined to evening hours, all the students, and they were few, working during the day in the near by retail and wholesale pharmacies. The establishment of chemical laboratories, where the student practically demonstrated what was taught in the class-room, was the first advance. Next came the pharmaceutic laboratory, devoted to the practical demonstration of the preparation of organic compounds; then the pharmacognosy room, and the microscopic laboratory, and today analytic and bacteriologic laboratories are being established. These extended courses of instruction demand that more time shall be devoted to the work, so that in place of all instruction being confined to evening hours, most schools now use a part of the day, and some occupy the entire time of the student, in courses extending over nine months in the year. Very many schools afford opportunity for farther work in optional and graduate courses.

Notwithstanding the increase in work and time demanded of the student of pharmacy, the number pursuing this study is greater than during any previous period. It will be

[1] "It should be remembered that the schools which led in the abandonment of the apprenticeship requirement did not take this course through any lack of appreciation of the value of actual experience, but because the requirement as frequently enforced was a farce. Very properly the university schools took the ground that their degrees should stand for school work only, and that no institution could honestly vouch for the value of something for which there could be no effective standard and which in many cases was of absolutely no value." *J. H. Beal.*

inferred from what has been stated, that those who are now engaged in retail pharmacies are more competent than their predecessors, and have a more thorough knowledge of the agents in which they deal. This is true if the average education is considered, but nevertheless commercial tendencies have exercised a disadvantageous influence. The conditions of trade in the past were such as to allow those pharmacists who were so inclined, to devote their entire time to the study, care and preparation of medicines. Today the greater part of the time of the pharmacist must be devoted to the commercial side of his work, or he will soon find himself without patrons, and therefore without the means to carry on his business. Again, many if not a majority of the agents in which he deals, may and must be had from the large manufacturer. These conditions have attracted the more studious and therefore the better educated pharmacists to those pursuits that foster the educational side of pharmacy, leaving the retail pharmacies in charge of those in whom the commercial spirit predominates. When the educational attainments of the retail pharmacist are considered, I question if he has made the advance that the teaching of the schools would indicate."

Legislation — Apothecaries were organized into a privileged body in civilized parts of Europe in the middle ages, and from that period those who dispense drugs have been required to possess certain qualifications. In the United States there have not been till lately any legal restrictions worthy of the name, but any ignorant boy whom an apothecary chose to employ has been free to dispense drugs.

Georgia seems to have been the first state that attempted to restrict the practice of pharmacy throughout the state to competent persons. The law, enacted in 1825, gave the state medical board power to examine and license apothecaries. The Alabama code of 1852 contained a similar provision. In 1868 a member of the Georgia board reported that he knew of only five licentiates of the board that were then engaged in business in the state. An act was passed

in New York in 1839 that applied solely to New York city, in Pennsylvania in 1866 that applied solely to Lycoming county. These early acts had little effect in protecting the public from ignorant apothecaries.

In 1869 a draft of a pharmacy law was recommended by the American pharmaceutical association which required graduation in pharmacy as a condition for license. It was hoped in this way to secure through the schools of pharmacy men better fitted by preliminary education and professional training for the practice of the profession. Rhode Island was the only state which enacted this law (March 1870), and it was amended in the following year. At present there is no pharmacy law in the United States which requires attendance and graduation at a school of pharmacy as a condition for license.

Since 1869 laws restricting the practice of pharmacy have been enacted in almost every state through the efforts of members of the profession. The American pharmaceutical association, organized in 1852, has been a potent factor in the attempt to give pharmacy a professional standing equal to that of other branches of medicine. Its work in this direction has been of special value since the creation in 1887 of the sections of education and legislation. A mass of material on pharmaceutic education and legislation in this country and abroad has been collected and made available through the annual reports of the association.

The 1898 report of the section on education and legislation of the American pharmaceutical association summarizes as follows the fundamental defects in present laws regulating the practice of pharmacy in the United States:

1 Failure to require a sufficient preliminary general education.

2 Failure to demand graduation from a school of pharmacy for admission to the licensing examination or for registration.

3 The privileges accorded to physicians, manufacturers, wholesalers, etc.

4 Failure to provide periods of apprenticeship and courses of study that would make it impracticable for any one to engage in the practice of pharmacy on his own account before the age of 24 or 25 years.

Dr J. H. Beal of the Department of pharmacy at Scio college, Ohio, was appointed by the section on education and legislation of the American pharmaceutical association at its 1899 meeting to draft a model pharmacy law. If approved this law can be introduced simultaneously into the legislatures of all the states. Dr Beal writes November 16, 1899: "Foreigners are often puzzled to account for the diversity in our legislation. The fact should be emphasized that all matters of internal police control are left exclusively to the several states, so that national laws regulating professional practice can not be enacted."

That a preliminary general education equivalent to graduation from an accredited high school will be required eventually for admission to the study of pharmacy is highly probable, but this demand will not be made for some time to come except by a few progressive states. Present tendencies indicate that graduation from an accredited school of pharmacy will also be required eventually for admission to the licensing test or for registration. The American pharmaceutical association and a number of state associations have within the last year favored this requirement.

Synopsis of present requirements — In 17 states a diploma in pharmacy does not now admit to practise, an examination being required in all cases:

Georgia	Massachusetts	New Hampshire	Pennsylvania
Illinois	Michigan	New York	South Dakota
Indiana	Minnesota	Ohio	Tennessee
Kentucky	Nebraska	Oregon	Wisconsin
Maine			

The following 14 states require for admission to the licensing examination:

Georgia, three years' experience or diploma

Illinois, four years' practical experience in compounding prescriptions; the physician a certificate from state board of health and four years' experience filling his own prescriptions

Indiana, four years' experience, two years in a pharmacy, time spent in approved school may be substituted

Kentucky, three years' practical experience in compounding physicians' prescriptions

Maine, three years' experience in compounding physicians' prescriptions or diploma of regularly incorporated school of medicine or pharmacy

Michigan, grammar school education, three years' experience

Minnesota, four years' experience in a pharmacy

Nebraska, three years' practical experience in pharmacy

New York, four years' experience in pharmacy

Ohio, four years' practical experience in a pharmacy, time spent in an approved school is deducted

Oregon, three years' experience in a pharmacy

Pennsylvania, four years' practical experience

South Dakota, common school education, three years' practice of pharmacy, or diploma from department of pharmacy, state agricultural college, and one year's practice in a pharmacy

Wisconsin, five years' practical experience in a pharmacy, or diploma of approved college and two years' practical experience

The following 4 require the licensing examination only:

Indiana Massachusetts New Hampshire Tennessee

The following political divisions require either an approved diploma or examination by state or other duly qualified boards:

Arkansas	Iowa	New Mexico	Texas
California	Kansas	New York city	Utah
Colorado	Louisiana	North Dakota	Washington
Connecticut	Baltimore, Md.	Oklahoma	West Virginia
Delaware	Montana	South Carolina	Wyoming
Dist. of Col.	Erie co., N. Y.		

The following political divisions in case of examination admit to it on:

California, grammar school education, four years' experience in a pharmacy

Colorado, four years' experience in compounding physicians' prescriptions

Connecticut, three years' instruction in pharmacy

Delaware, three years' continuous practical experience in retail drug business

District of Columbia, diploma of respectable medical school, or four years' experience in a pharmacy

Iowa, two years' practical experience in pharmacy, one year allowed for time spent in recognized school, or medical diploma with three years' actual practice of medicine

Kansas, four years' experience in compounding physicians' prescriptions

Louisiana, grammar school education, sufficient knowledge of chemistry and practice of pharmacy

Montana, four years' experience in compounding physicians' prescriptions

New Jersey, four years' experience in a pharmacy

New York city and Erie county, New York, four years' experience in a pharmacy

North Dakota, four successive years' practical experience in a pharmacy

Oklahoma, four years' experience in compounding prescriptions

South Carolina, three years' experience in a pharmacy

Utah, four years' practical experience in a pharmacy

Vermont, practice in pharmacy or served apprenticeship for three years

Virginia, four years' practical experience in a pharmacy

Washington, three years' practical experience in a pharmacy

Wyoming, two years' practical experience in a pharmacy

Vermont accepts also an approved diploma of medical school.

The following grant licenses on examination by state boards and to physicians in certain cases:

Mississippi New Jersey North Carolina Virginia

Alabama and Missouri accept also an approved diploma.

Rhode Island grants license on examination by state board and to practitioners in certain cases.

Idaho requires approved diploma or examination by county board.

Florida requires approved diploma or examination by state board or by local physicians. Authorized physicians are licensed without examination.

In Cuba, the Philippines[1] and Puerto Rico[1] the requirements are in process of transition.

Alaska, Arizona, Hawaii, Indian territory and Nevada have no laws.

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[1] See note under Synopsis of present requirements in medicine.

7 VETERINARY MEDICINE[1]

Early veterinary schools — Veterinary medicine was pursued as a science by the ancient Egyptians and by the Greeks, but after the destruction of the eastern empire little progress was made in this science till the establishment of a veterinary school at Lyons in 1762. This institution was soon followed by similar schools in other European countries.

Before 1850 graduates in veterinary medicine were almost unknown in America, some of the larger cities only being able to furnish isolated veterinarians who had been educated in the veterinary schools of Europe. The country as a whole, including most of the large cities, had to be satisfied with such service as could be had from the blacksmith, from the physician who sought to apply to animals the principles taught in the medical schools and from the *horse doctor* who, with no basis whatever of medical knowledge, boldly and recklessly administered drugs.

The first step toward systematic veterinary education was the granting of a charter in 1852 by the legislature of Pennsylvania, and the securing of a subscription of $40,000, to serve in the organization of a veterinary school in Philadelphia. This school opened in 1853 but no students responded. In 1859–60 two students were secured, one of whom was a graduate of the Boston veterinary college which had been chartered in 1855. Both of these schools had a short life, but the same cities have now each its veterinary school in connection with the University of Pennsylvania and Harvard respectively. Each of these schools has a matriculation examination and a three years' course of eight months each. In 1857 the New York college of veterinary surgeons was chartered and in 1875 the American veterinary college was opened. These two New York city schools were maintained as proprietary institutions till

[1] The historical part of this outline was prepared mainly by Prof. James Law of Cornell university.

1899 when they were placed on a strictly university footing by consolidation under New York university.

In the succeeding years veterinary schools sprang into existence in many of the large cities, Chicago, Kansas City, Cincinnati, Baltimore, Washington, Grand Rapids, Detroit, etc., all like the earlier schools in Boston, Philadelphia and New York, being private ventures, dependent on their financial returns, and with a curriculum of 10 or 12 months representing two years of five or six months each.

Advances made by state schools — The necessity for a fuller, graded course based on matriculation requirements which would be a guaranty of fitness to pursue such course profitably, was first voiced by schools connected with state colleges and universities. As early as 1868, Illinois industrial university[1] and Cornell university instituted 2 veterinary chairs, and filled them with graduates of the Royal college of veterinary surgeons, England. Students were admitted only on the basis of the regular university matriculation and were held to a course of 4 years. Illinois industrial university is said to have turned out several good practitioners, while Cornell graduated 4 veterinarians, 3 of whom have been prominent and valued members of the United States bureau of animal industry, 1 being its chief. These institutions were followed in 1879 by the veterinary department of the Iowa agricultural and mechanical college with moderate matriculation requirements, and a three years' graded course, in 1889 by the veterinary department of the Ohio state university with equal or still greater requirements, and in 1890 by the veterinary department of the university of Minnesota with similar standards.

The important advances made by these state schools of veterinary medicine may be better illustrated by the fact that their academic year extends to eight or nine months, while the year of the private school covered but five or six months. The total curriculum of the state veterinary school therefore extended from 24 to 27 months or in the case of

[1] Became University of Illinois in 1885.

Cornell university to 36 months, as against the 10 or 12 months of the private school.

Requirements of American veterinary medical association — The United States veterinary medical association,[1] adopted in 1891 an article providing that all applicants for membership should be graduates of a recognized veterinary school with a curriculum of at least three years, of six months each, and a corps of instructors comprising at least four veterinarians. Nearly all the schools which had not already done so soon placed themselves in harmony with these requirements.

New York's leadership — The next step in advance came in 1895 when the New York legislature enacted that at least a high school diploma representing four years of high school work should be offered for admission to a veterinary school, that the veterinary curriculum should embrace three full years, and that only those who had met both requirements could be admitted to the regents veterinary examination for license to practise in the state. For the present this places New York in the lead. To begin practice in this state the candidate must reach a standard which is not demanded in any other state in the Union. But even within New York state there have been inequalities in the curriculum. In the private veterinary schools in New York city, the old session of six months has stood for a year, while in the New York state veterinary college, Cornell university, a nine-month year is required. To the legal requirement for matriculation, therefore, which is common to all schools in the state, the period devoted to veterinary education in the state school at Cornell is one half longer than that which has been required in the private schools in New York city. Now that these schools have consolidated under New York university, it is hoped that these inequalities will disappear. As a means of extending the benefits of its curriculum to their full legal possibilities, Cornell offers tuition free to all residents of the state, and opens to competition by the

[1] Now the American veterinary medical association.

entering veterinary student 18 scholarships of an annual value of $200 and to veterinary graduates a fellowship of an annual value of $500.

Action in Massachusetts — The legislature of Massachusetts has recently appropriated $25,000 for a veterinary laboratory and stable hospital in connection with the state agricultural college. Beginning with Jan. 1, 1899 there is to be an annual appropriation of $1000 as a fund for the maintenance of the veterinary laboratory.

Higher standards — An impartial survey of the entire field shows a marked tendency toward higher standards and, as an important step in this direction, the assumption of the work of veterinary education by the state under such university supervision as will give it character and eliminate the disturbing element of personal pecuniary speculation.

Army veterinary service — The United States army has long had its nominal veterinarians, but many of these were uneducated men, appointed by political influence or advanced from the position of farrier major, and there was little to tempt professional men of character and ability into this service. The army veterinarian had practically no army status, no rights, no prospects. He was not even enlisted, there was no special provision for him during service and no pension if he had to retire disabled. In the last session of congress the first step was taken for the improvement of the army veterinary service by enacting that the army veterinarian of the first grade must enter on the basis of an examination to be prescribed by the secretary of war, and that he shall have the pay and allowances of a second lieutenant of cavalry, while those of the second grade shall have $75 a month and the allowances of a sergeant major.

Veterinary workers in agricultural colleges and experiment stations — A steadily increasing recognition of the veterinary profession is seen in the appointment of veterinarians to chairs in state agricultural colleges and to positions in agricultural experiment stations. Here too the selection thoroughly sustains the growing demand for higher standards.

32 such positions are filled, practically without exception, by men who have passed an exacting matriculation examination and have had a prolonged course of veterinary study. Many add to their veterinary degree the academic B. A., B. S., B. Agr., or the professional M. D.

Municipal, state and national veterinarians — Since its organization in 1882 the United States bureau of animal industry has provided the different states with the funds necessary for the eradication of the cattle lung plague which had been imported from Europe in 1848, the expert and other employees having been made both national and state officers so that they could act as one or the other as the case demanded. It has done most valuable work on Texas fever, anthrax, emphysematous anthrax, hog cholera, swine plague and many other epizootic, enzootic, dietetic and contagious diseases, following the lines of prevention, immunization and serum therapy. It has continued the quarantine of imported animals since it superseded the treasury cattle commission in 1882. It has instituted meat inspection by experts in national employ, at the great packing centers, of meats intended for the export or interstate trade. In a number of states, a state veterinarian and even assistant state veterinarians have been appointed and, though in some instances the old spoils system has retained sufficient vitality to have the inexpert appointed to do expert work, yet in the main the interests of the public and of the profession have been consulted in the appointment of men educated in the duties of the office. In many of the larger cities too, the veterinarian has been recognized in his appointment as municipal meat inspector or as stock inspector. With the continued improvement of the civil service and the imperative demand for public servants who are specially trained and efficient in performing their respective duties, this recognition must soon become the rule.

Indications from veterinary literature — A review of recent veterinary literature shows much thought and research, yet as an indication of the predominant influence of sani-

tary science and the control of contagious diseases, it need only be said that of papers presented before the American veterinary medical association two thirds have been on such subjects. This indicates a healthful interest in the most vital and promising fields of veterinary research, and speaks well for the supply of experts to work in this field in the future. It is worthy of note that in all strong veterinary schools work in bacteriology is made a first consideration.

Field for educated veterinarians — In 1888 there were 6 veterinary schools with 323 students. In 1899 there were 17 schools with 249 instructors and 378 students. 6 of these 17 schools are separate institutions, 11 are departments of other institutions. 7 maintain day sessions, 3 have both day and evening sessions, 7 do not report this item. 16 schools confer degrees.

There is a broad field in the United States for educated veterinarians, and in view of this fact it is surprising that there are not more veterinary medical students. To assert that this is due to the lengthening to three years of the courses in the veterinary medical schools and to the use of bicycles and electric cars as substitutes for horses is not a satisfactory explanation. Horses will always be in large demand. Furthermore, the close relation between the health of man and that of the domestic animals, specially those that furnish meat and milk, shows the necessity of careful attention to their health. The reports of the department of agriculture give a value of about $2,000,000,000 to the live stock of the United States, and the protection of these enormous interests demands the services of trained veterinarians. The science of meat inspection has not as yet commanded with us the attention it should receive. The work of the national government in this respect is confined to international and interstate trade, principally to the large western packing houses. Local municipal inspection is in its infancy and state legislatures have not as a rule enacted special measures of protection. There now seems to be, however, an increasing demand for scientific work

along these lines and the best veterinary schools are recognizing this necessity in their courses of study.

Synopsis of requirements — The first law restricting the practice of veterinary medicine was enacted in New York in 1886. In 1899, 12 states had veterinary medical laws.

In 5 states a veterinary diploma does not admit to the practice of veterinary medicine, an examination being required in all cases:

Minnesota New York North Dakota Pennsylvania Virginia

The following require for admission to the licensing examination:

Minnesota, diploma from veterinary school

New York, full high school course, diploma of veterinary school with satisfactory standard

North Dakota, diploma from veterinary school

Pennsylvania, competent common school education, approved diploma from legally incorporated veterinary school having a course of three years

Virginia requires the licensing examination only

Illinois requires approved veterinary diploma or 3 years' practice or examination

Ohio requires approved veterinary diploma or examination by state board

California and Maryland require veterinary diploma approved by state board

New Jersey admits on veterinary diploma submitted to unqualified local authority

Wisconsin admits on veterinary diploma or certificate submitted to unqualified local authority, and practitioners five years prior to 1887

Michigan registers veterinary medical degrees without examination and issues certificates of "veterinary surgeon" to those who pass the examinations of the state veterinary board.

The other states and territories have no laws on the subject.